FIG. 1

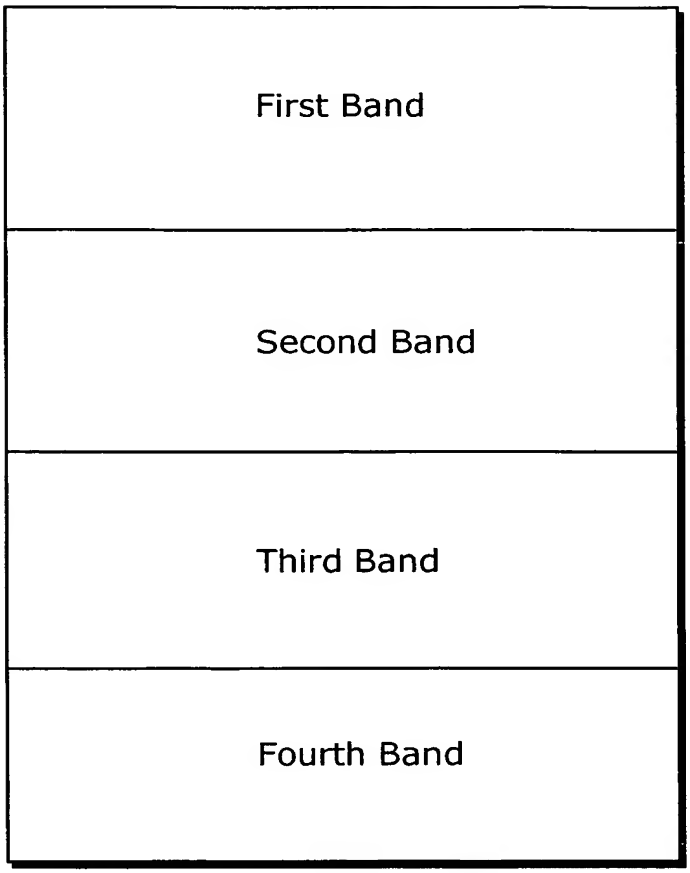

First Band
Second Band
Third Band
Fourth Band

FIG. 2

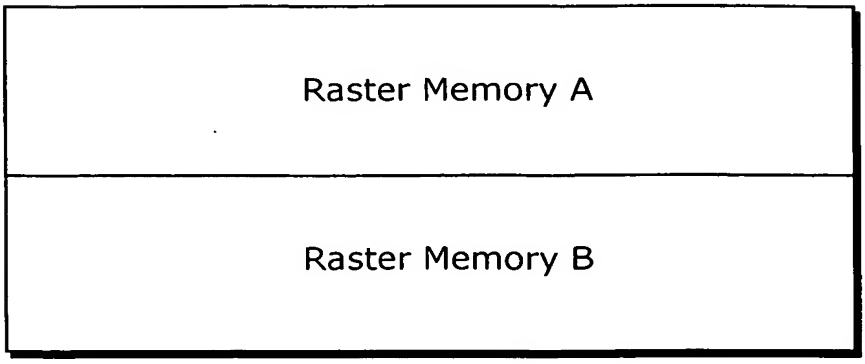

Raster Memory A
Raster Memory B

FIG. 3

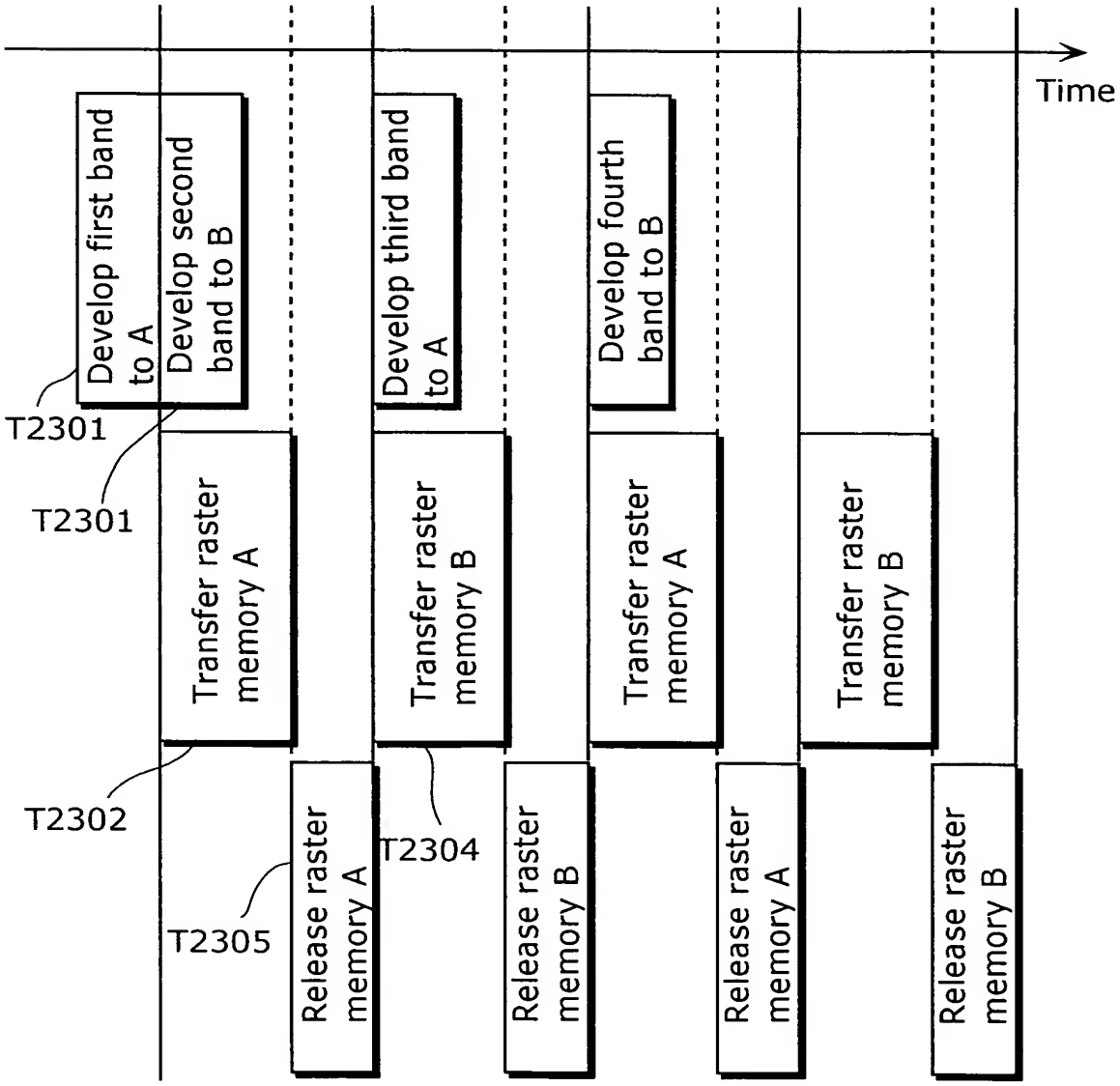

Time
Develop first band to A
Develop second band to B
Develop third band to A
Develop fourth band to B
T2301
T2301
Transfer raster memory A
Transfer raster memory B
Transfer raster memory A
Transfer raster memory B
T2302
T2304
T2305
Release raster memory A
Release raster memory B
Release raster memory A
Release raster memory B

FIG. 4

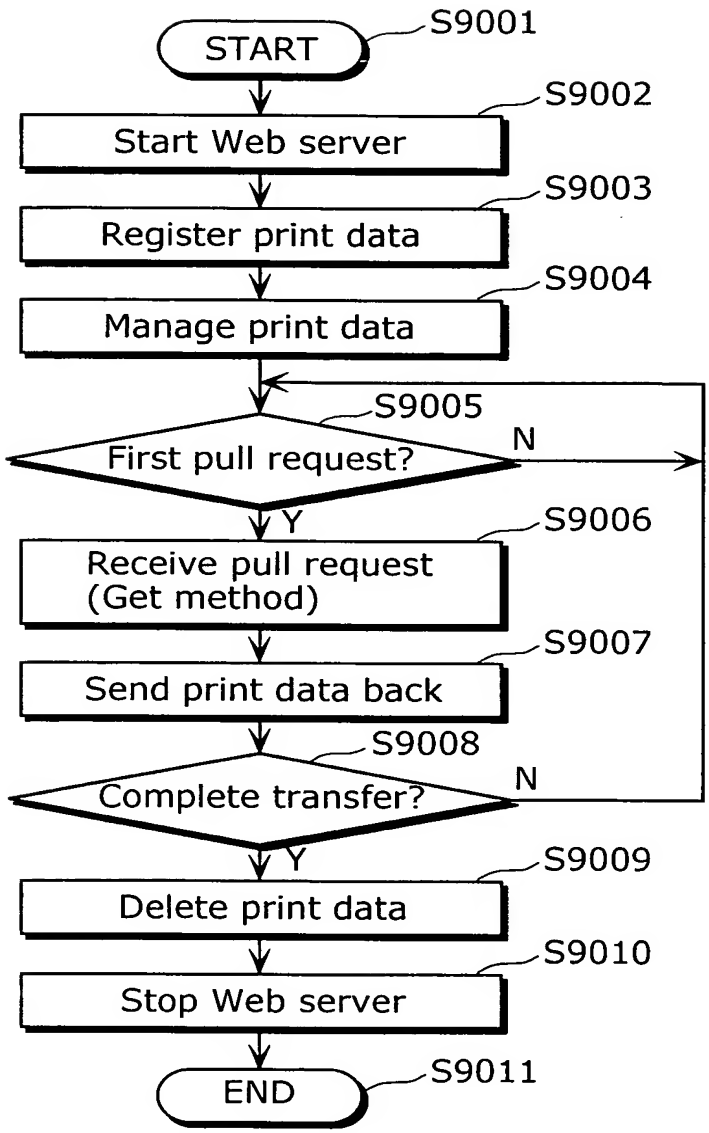

START
S9001
Start Web server
S9002
Register print data
S9003
Manage print data
S9004
First pull request?
S9005
N
Y
Receive pull request (Get method)
S9006
Send print data back
S9007
Complete transfer?
S9008
N
Y
Delete print data
S9009
Stop Web server
S9010
END
S9011

FIG. 5

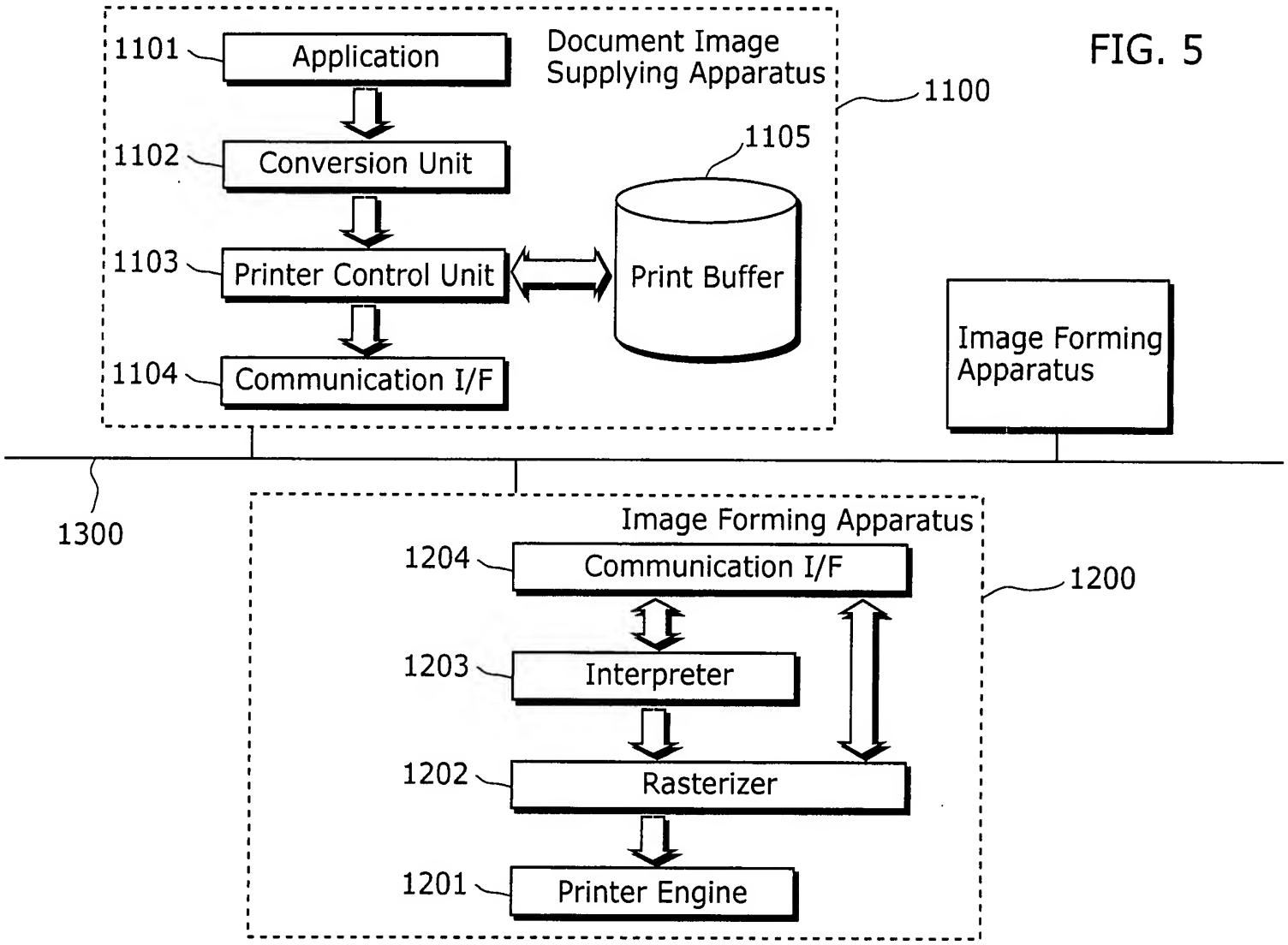

1101
Application
Document Image Supplying Apparatus
1100
1102
Conversion Unit
1105
1103
Printer Control Unit
Print Buffer
1104
Communication I/F
Image Forming Apparatus
1300
Image Forming Apparatus
1204
Communication I/F
1200
1203
Interpreter
1202
Rasterizer
1201
Printer Engine

FIG. 6

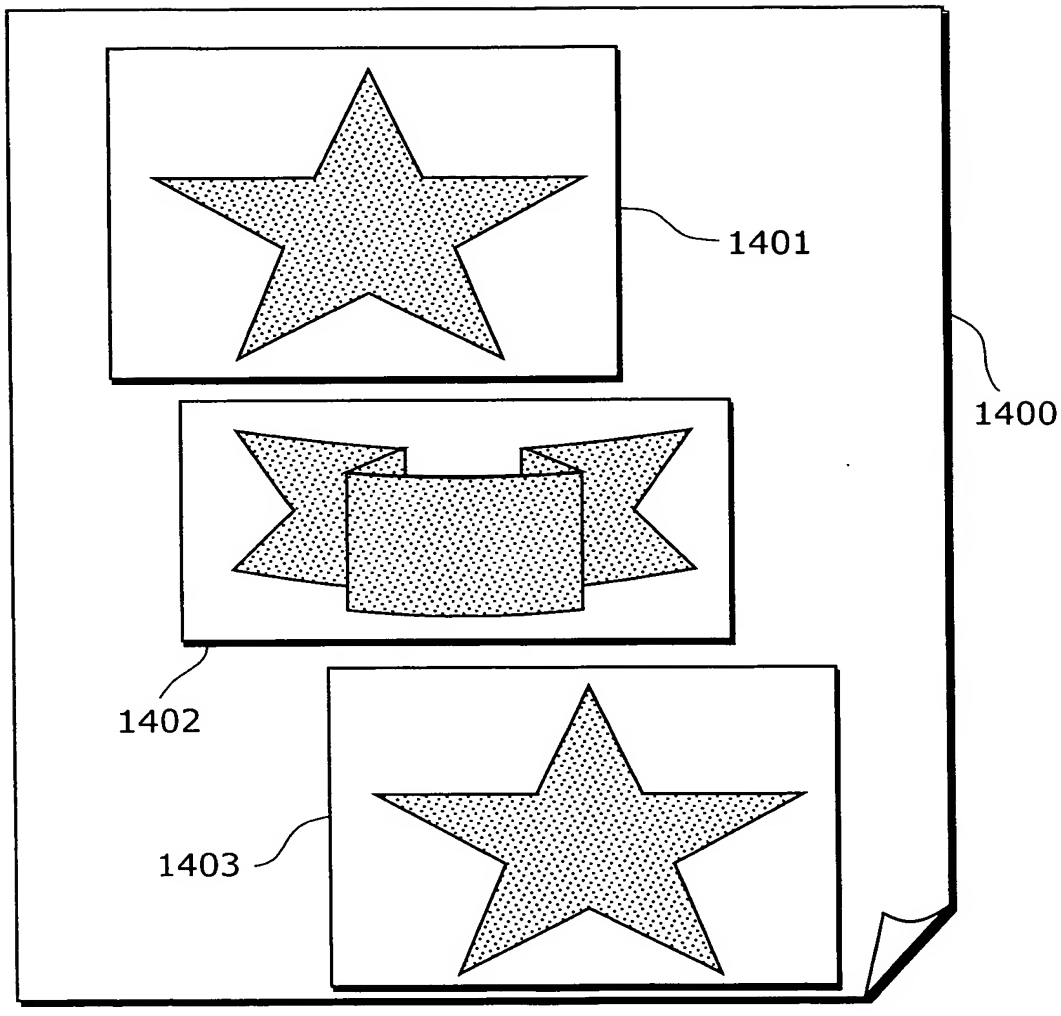


FIG. 7

1404

```
<!DOCTYPE HTML PUBLIC "-//W3C//DTD XHTML 1.1//EN"
 "http://www.w3.org/TR/xhtml11/DTD/xhtml11.dtd">
 <html xmlns="http://www.w3org/1999/xhtml">
<!-- head -->
<head>
<title>280mm210mm</title>
<meta http-equiv="Content-Style-Type" content="text/css"/>
<link rel="stylesheat" type="text/css" media="screen" href="xhtml.css"/>
<style media="screen,print" type="text/css">
</style>
</head>
<body>

<img id="front" src="front.jpg" alt="front" /><br>
<img id="side" src="side.jpg" alt="side" /><br>
<img id="front" src="front.jpg" alt="front" /><br>

</body>
</html>
```

FIG. 8

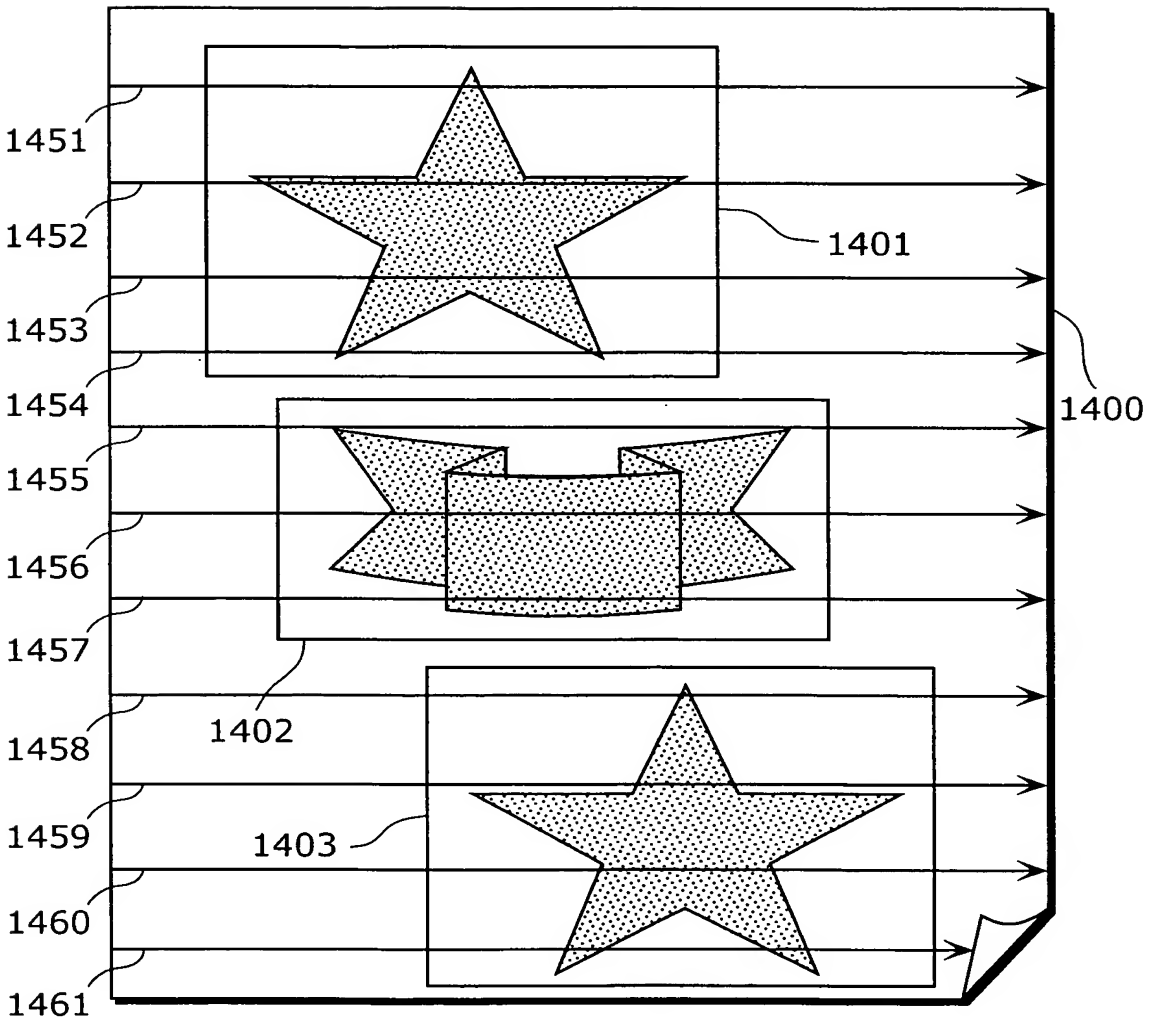

1451
1452
1453
1454
1455
1456
1457
1458
1459
1460
1461
1401
1402
1403
1400

FIG. 9

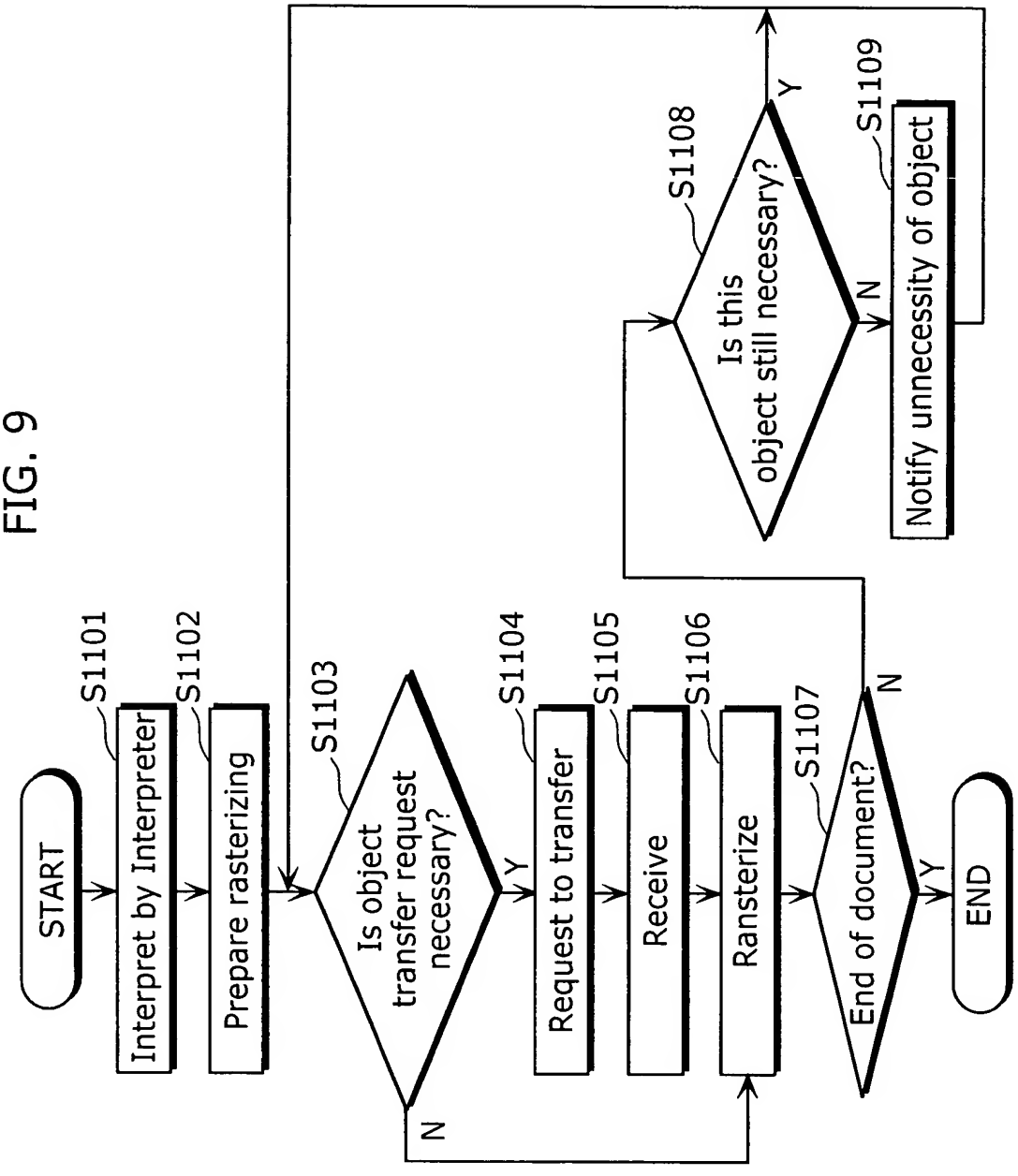

START
S1101
Interpret by Interpreter
S1102
Prepare rasterizing
S1103
Is object transfer request necessary?
Y
N
S1104
Request to transfer
S1105
Receive
S1106
Ransterize
S1107
End of document?
Y
N
END
S1108
Is this object still necessary?
Y
N
S1109
Notify unnecessity of object

FIG. 10

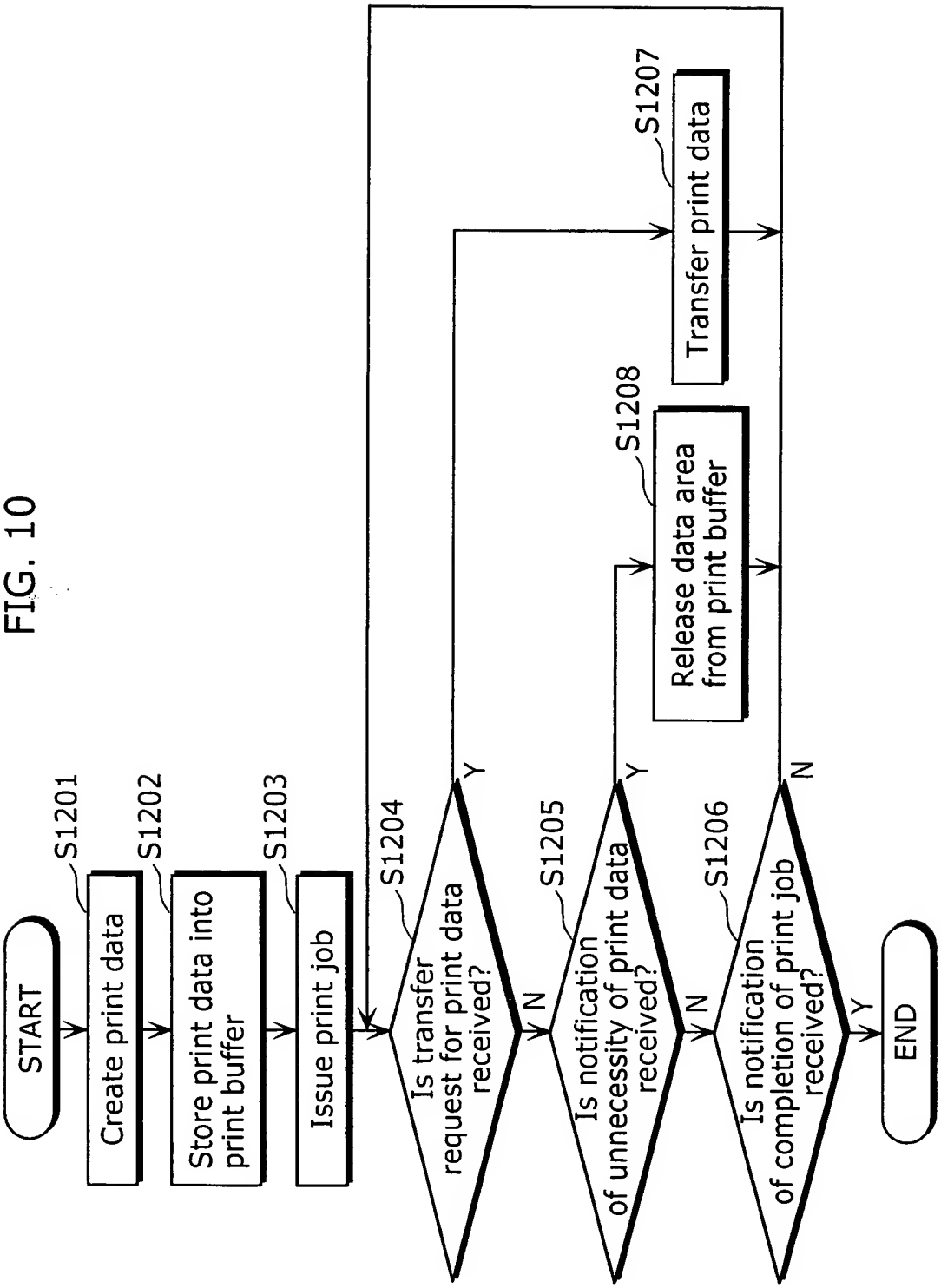

START
S1201
Create print data
S1202
Store print data into print buffer
S1203
Issue print job
S1204
Is transfer request for print data received?
Y
N
S1205
Is notification of unnecessity of print data received?
Y
N
S1206
Is notification of completion of print job received?
N
Y
END
S1207
Transfer print data
S1208
Release data area from print buffer

FIG. 11

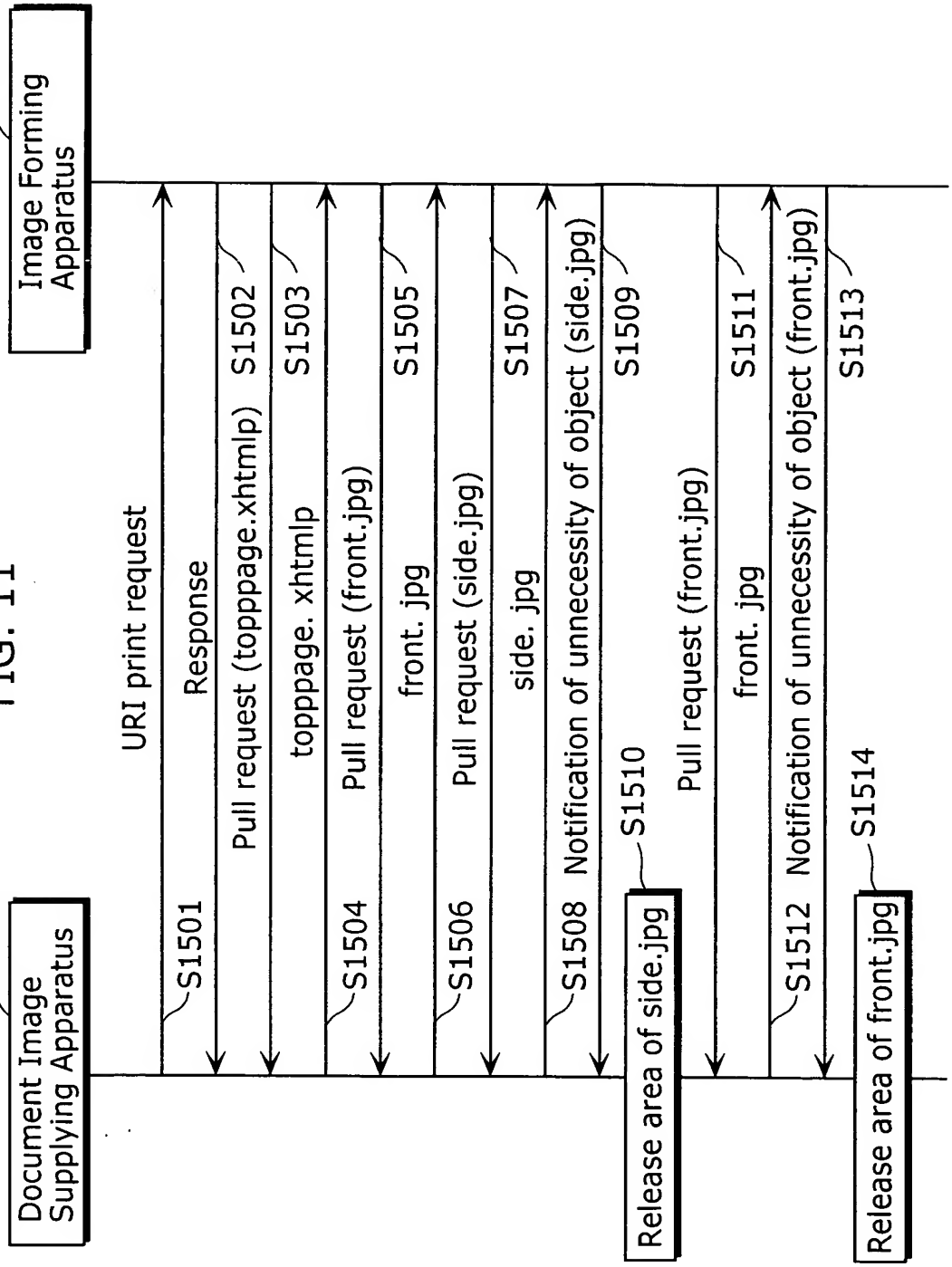

1100
Document Image Supplying Apparatus
1200
Image Forming Apparatus
URI print request
S1501
Response
Pull request (topppage.xhtmlp)
S1502
topppage. xhtmlp
S1503
Pull request (front.jpg)
S1504
front. jpg
S1505
Pull request (side.jpg)
S1506
side. jpg
S1507
Notification of unnecessity of object (side.jpg)
S1508
S1509
Release area of side.jpg
S1510
Pull request (front.jpg)
S1511
front. jpg
S1512
Notification of unnecessity of object (front.jpg)
S1513
Release area of front.jpg
S1514

FIG. 12

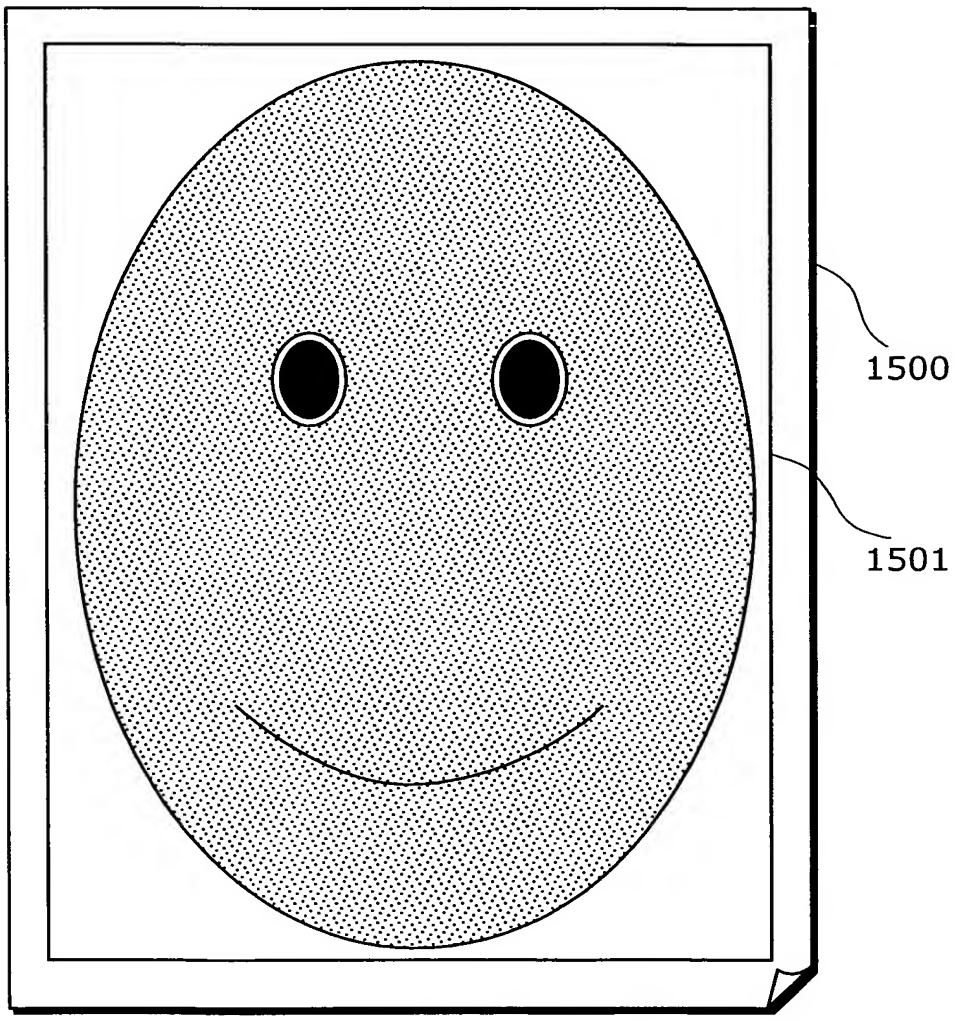


FIG. 13

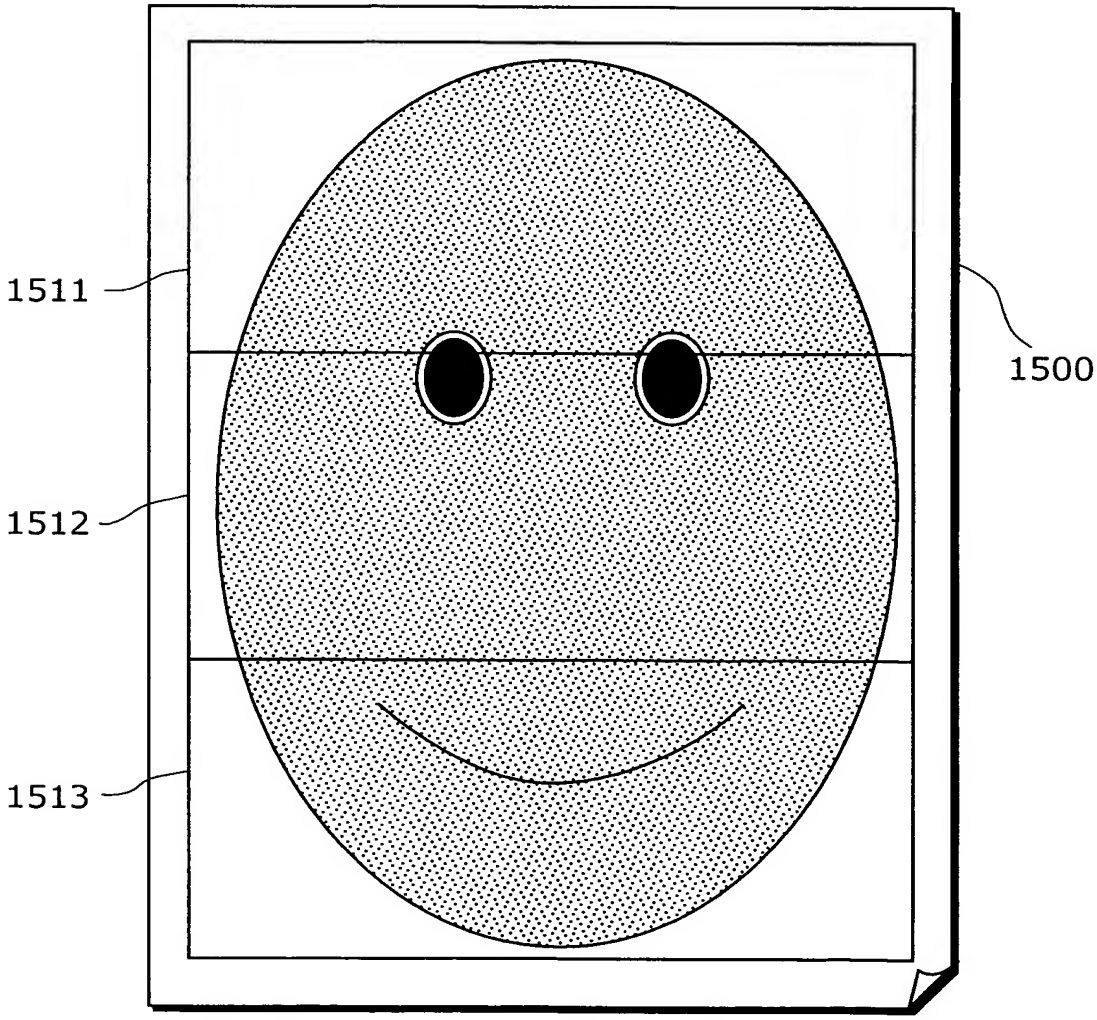


FIG. 14

1514

```
<!DOCTYPE HTML PUBLIC "-//W3C//DTD XHTML 1.1//EN"
 "http://www.w3.org/TR/xhtml11/DTD/xhtml11.dtd">
 <html xmlns="http://www.w3org/1999/xhtml">
<!-- head -->
<head>
<title>280mm210mm</title>
<meta http-equiv="Content-Style-Type" content="text/css"/>
<link rel="stylesheat" type="text/css" media="screen" href="xhtml.css"/>
<style media="screen,print" type="text/css">
</style>
</head>
<body>

<img id="img01" src="img01.jpg" alt="img01" /><br>
<img id="img02" src="img02.jpg" alt="img02" /><br>
<img id="img03" src="img03.jpg" alt="img03" /><br>

</body>
</html>
```

FIG. 15

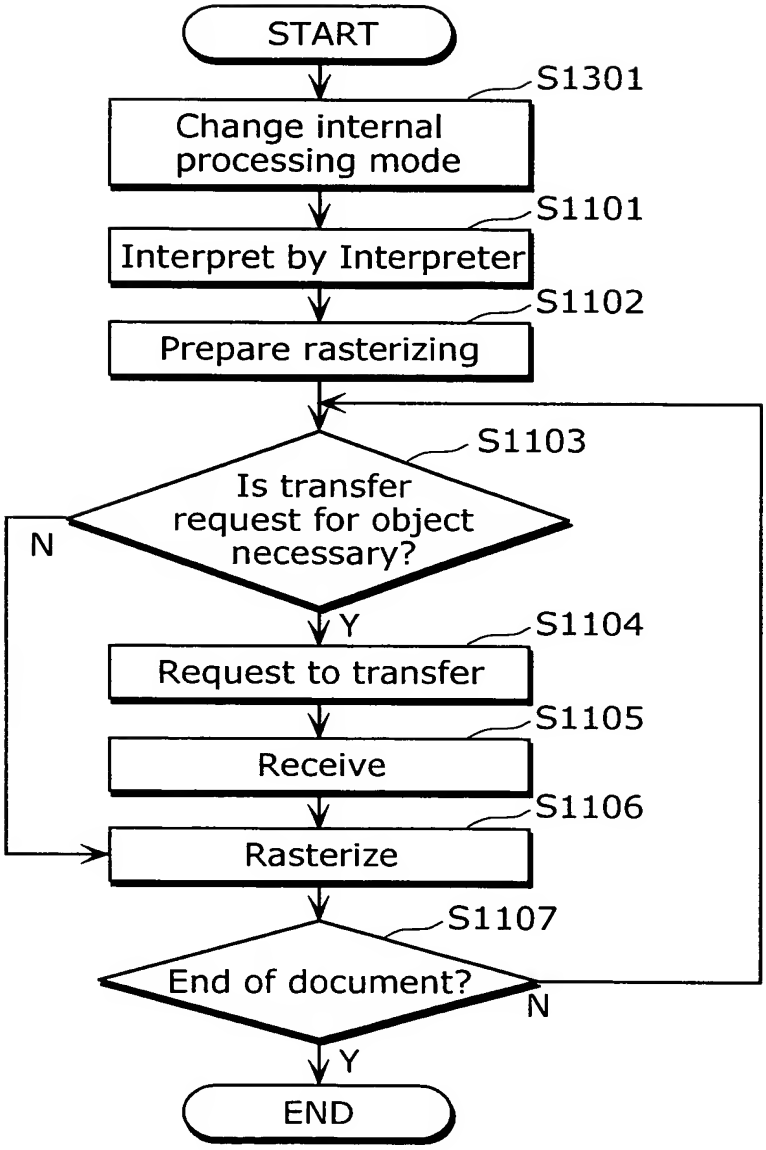

START
S1301
Change internal processing mode
S1101
Interpret by Interpreter
S1102
Prepare rasterizing
S1103
Is transfer request for object necessary?
N
Y
S1104
Request to transfer
S1105
Receive
S1106
Rasterize
S1107
End of document?
N
Y
END

FIG. 16

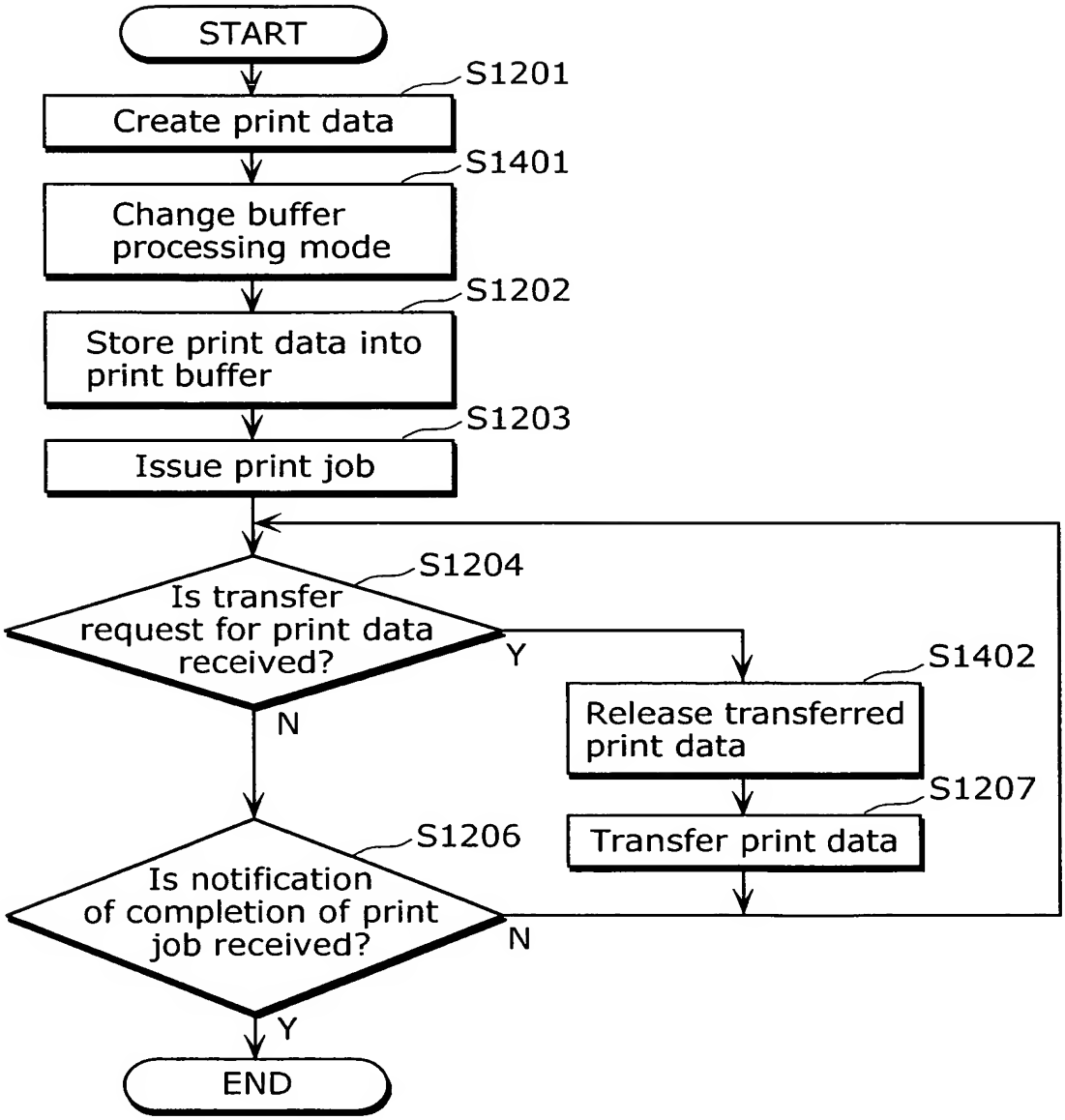

START
S1201
Create print data
S1401
Change buffer processing mode
S1202
Store print data into print buffer
S1203
Issue print job
S1204
Is transfer request for print data received?
Y
N
S1402
Release transferred print data
S1207
Transfer print data
S1206
Is notification of completion of print job received?
N
Y
END

FIG. 17

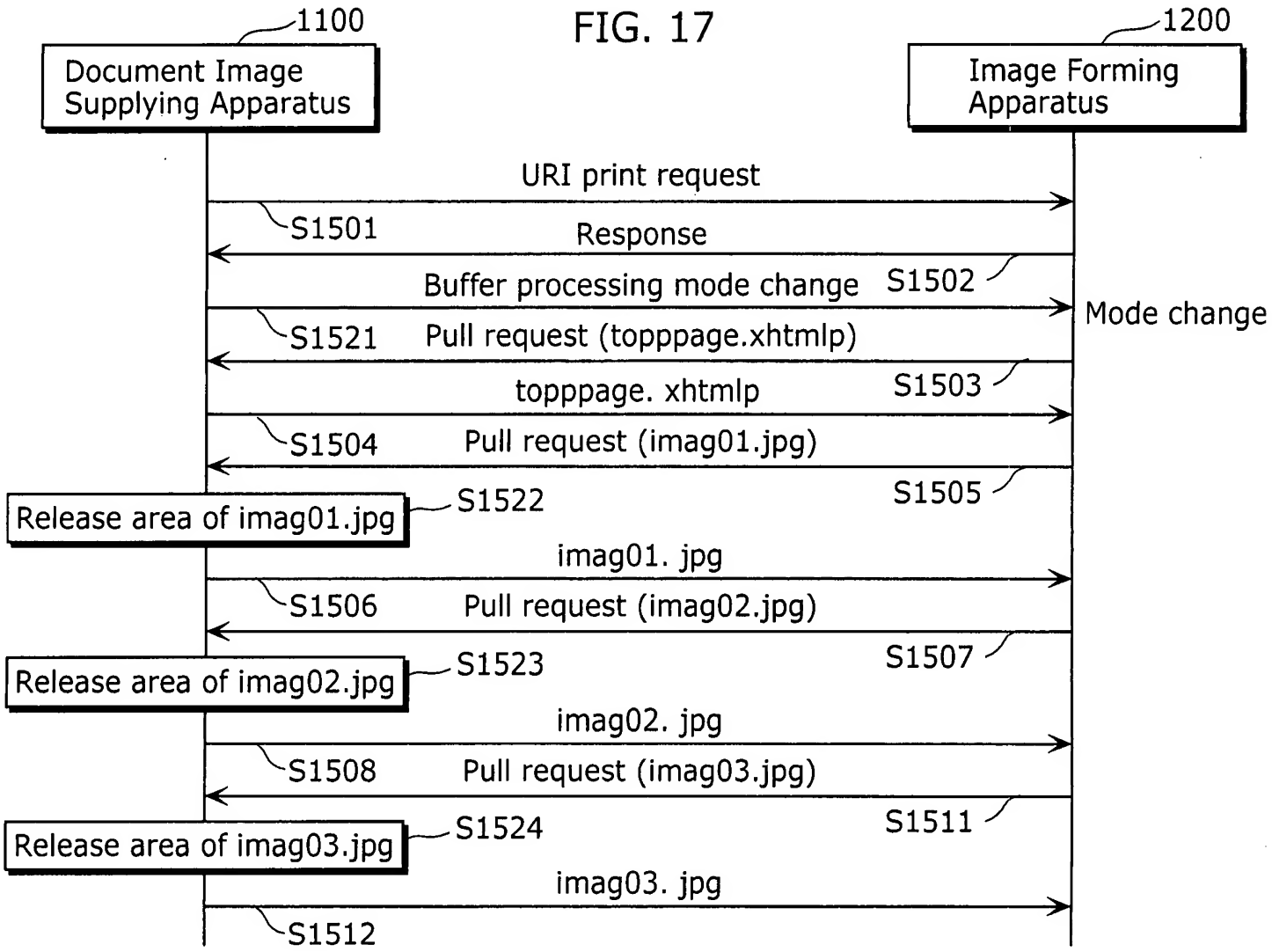

1100
Document Image Supplying Apparatus
1200
Image Forming Apparatus
URI print request
S1501
Response
Buffer processing mode change
S1502
Mode change
S1521
Pull request (topppage.xhtmlp)
topppage. xhtmlp
S1503
S1504
Pull request (imag01.jpg)
S1505
Release area of imag01.jpg
S1522
imag01. jpg
S1506
Pull request (imag02.jpg)
S1507
Release area of imag02.jpg
S1523
imag02. jpg
S1508
Pull request (imag03.jpg)
S1511
Release area of imag03.jpg
S1524
imag03. jpg
S1512

FIG. 18

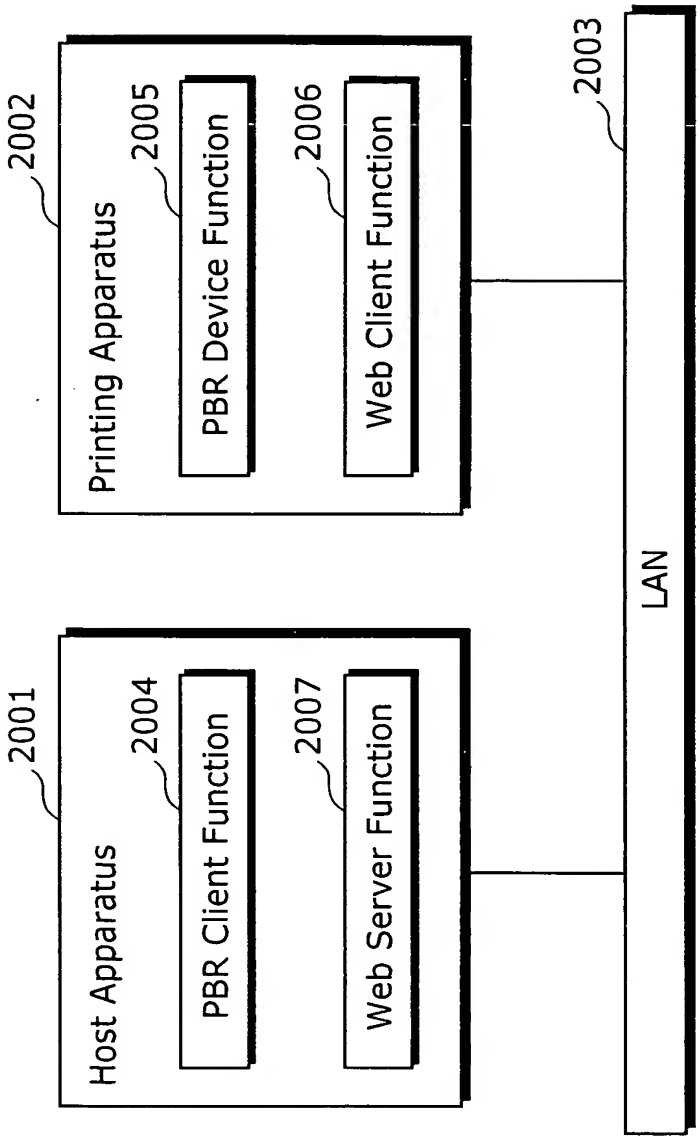

2
2001
Host Apparatus
2004
PBR Client Function
2007
Web Server Function
2002
Printing Apparatus
2005
PBR Device Function
2006
Web Client Function
2003
LAN

FIG. 19

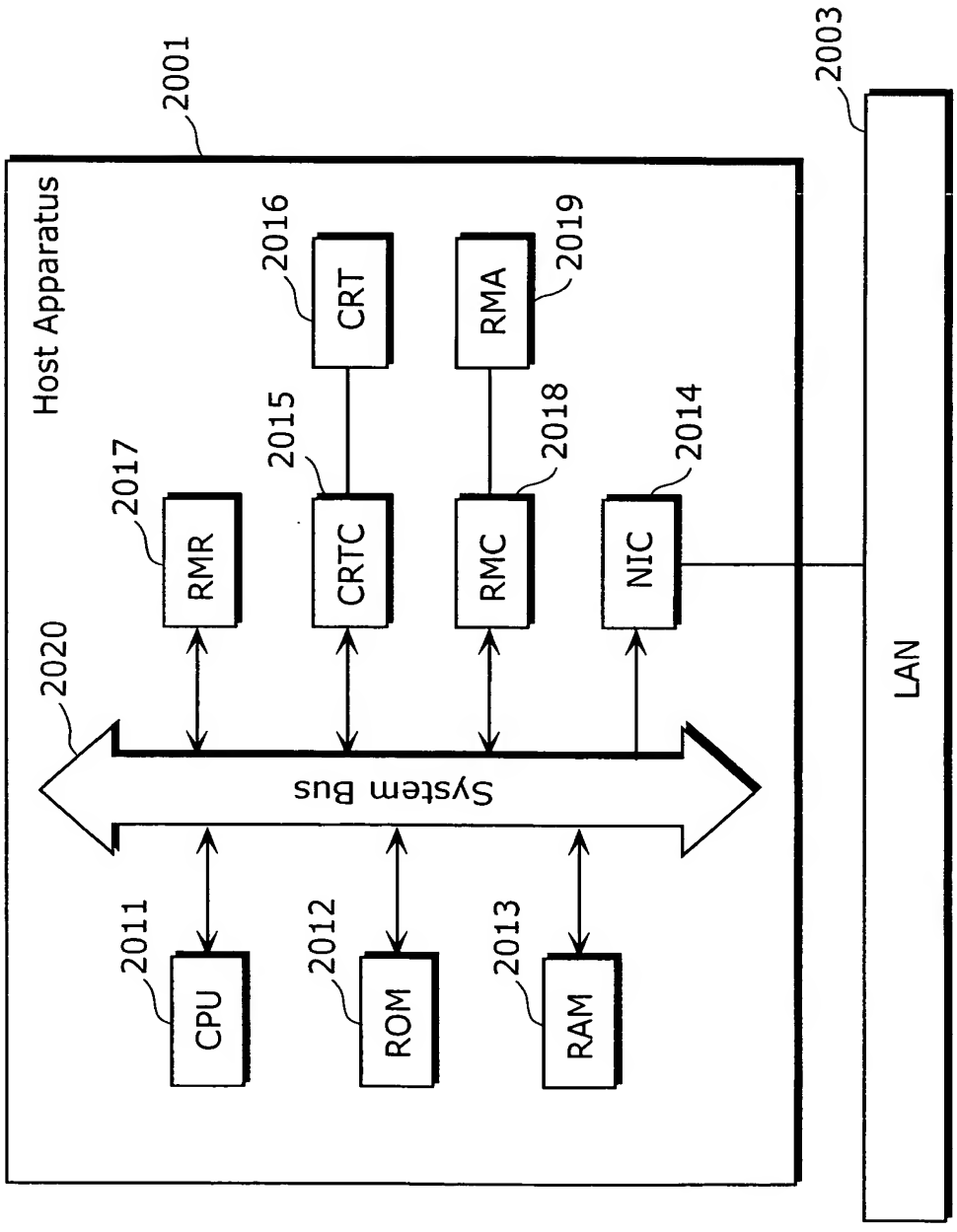

2001
Host Apparatus
2003
LAN
2011
CPU
2012
ROM
2013
RAM
2014
NIC
2015
CRTC
2016
CRT
2017
RMR
2018
RMC
2019
RMA
2020
System Bus

FIG. 20

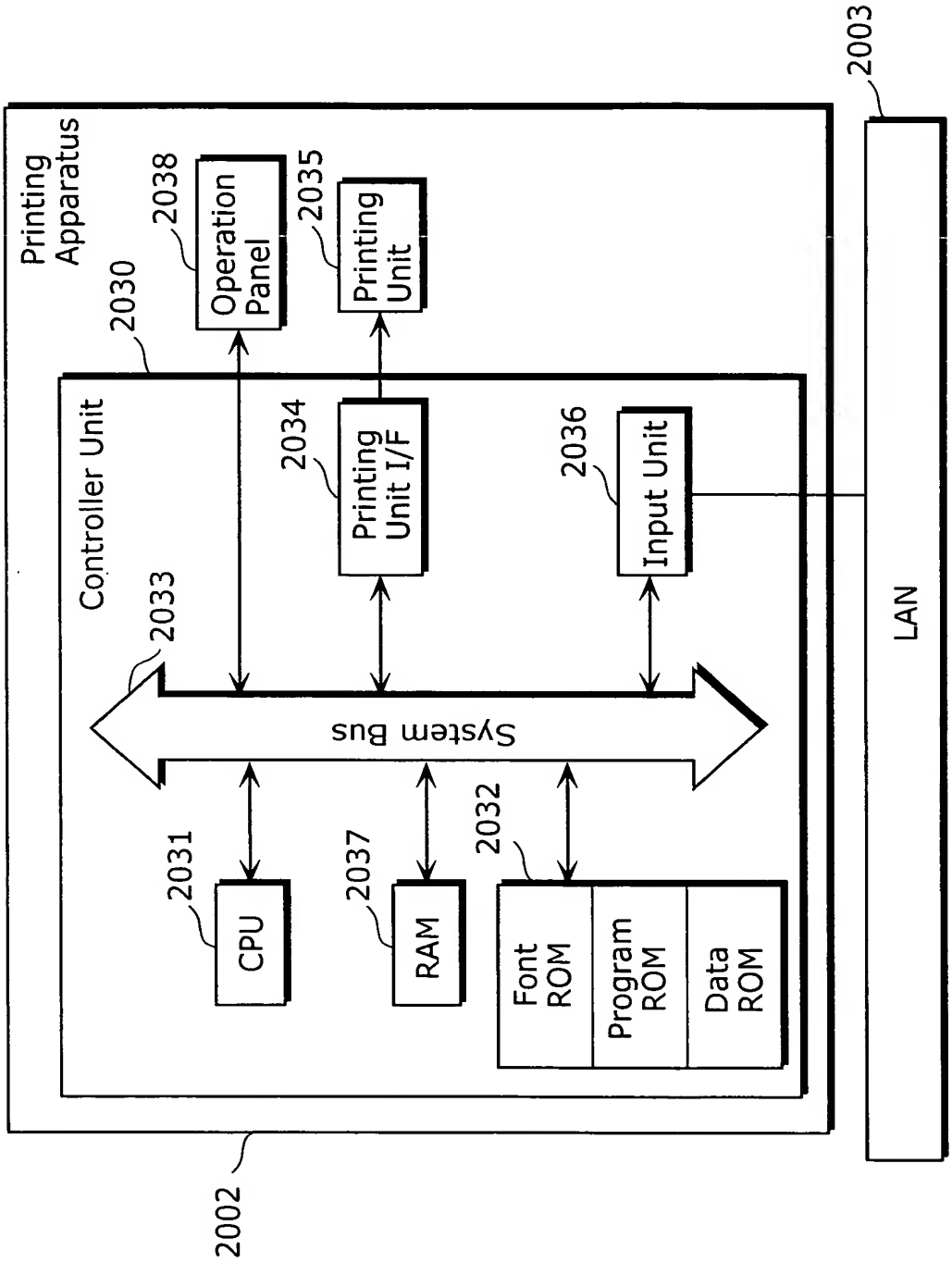

2003
LAN
Printing Apparatus
2038
Operation Panel
2035
Printing Unit
2030
Controller Unit
2034
Printing Unit I/F
2036
Input Unit
2033
System Bus
2031
CPU
2037
RAM
2032
Font ROM
Program ROM
Data ROM
2002

FIG. 21

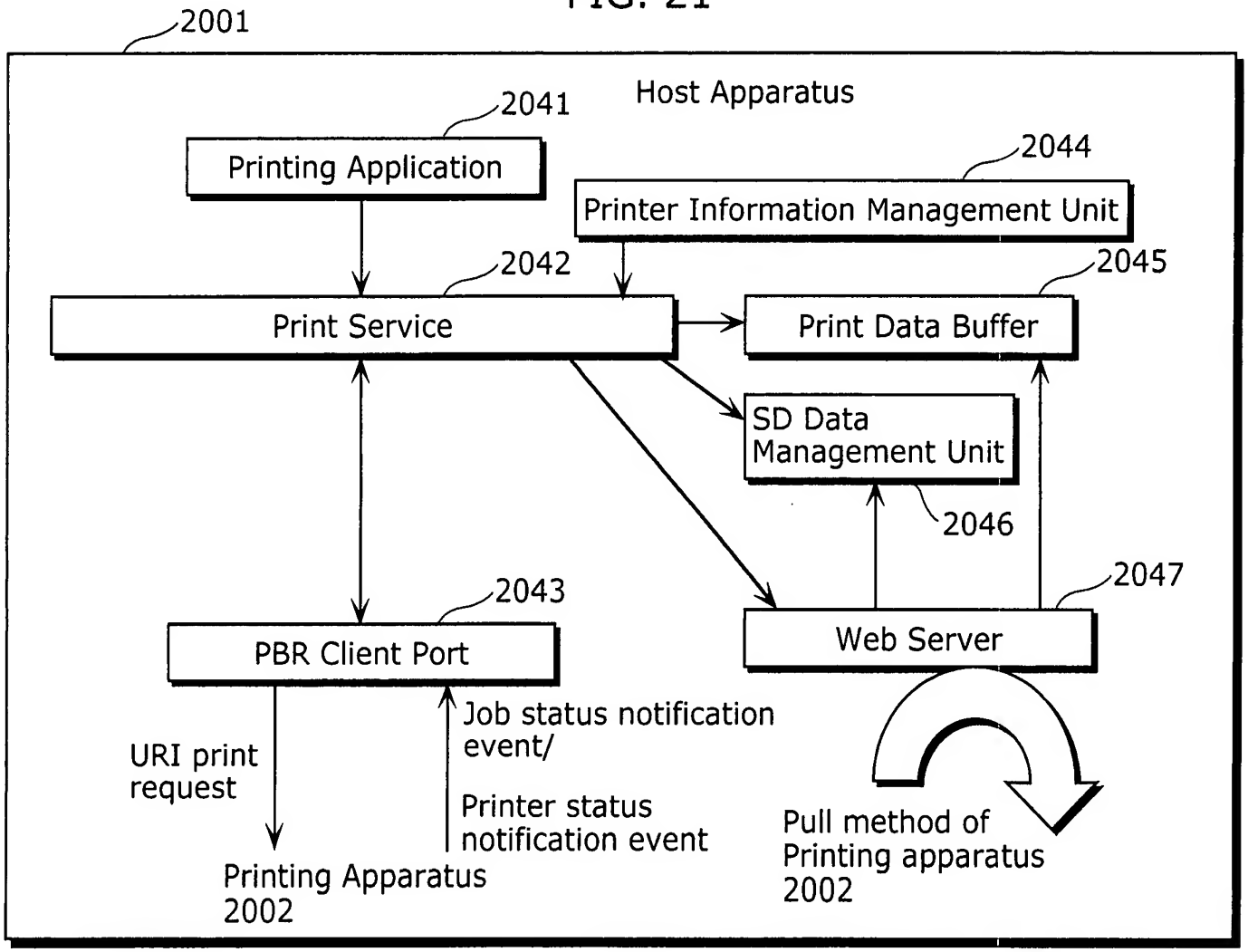

2001
Host Apparatus
2041
Printing Application
2044
Printer Information Management Unit
2042
2045
Print Service
Print Data Buffer
SD Data Management Unit
2046
2047
2043
PBR Client Port
Web Server
Job status notification event/
URI print request
Printer status notification event
Printing Apparatus 2002
Pull method of Printing apparatus 2002

FIG. 22

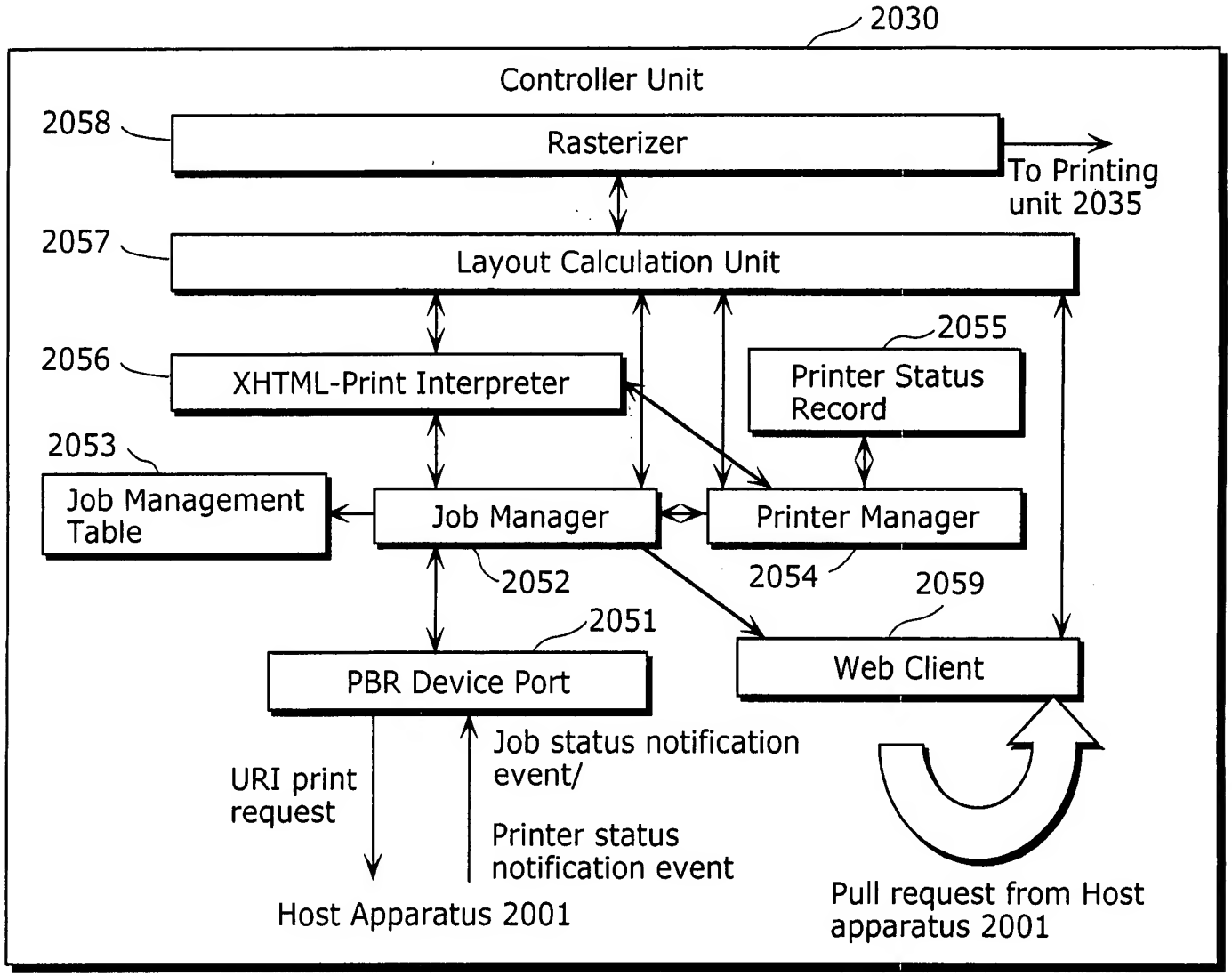

2030
Controller Unit
2058
Rasterizer
To Printing unit 2035
2057
Layout Calculation Unit
2056
XHTML-Print Interpreter
2055
Printer Status Record
2053
Job Management Table
Job Manager
Printer Manager
2052
2054
2059
2051
PBR Device Port
Web Client
URI print request
Job status notification event/
Printer status notification event
Host Apparatus 2001
Pull request from Host apparatus 2001

FIG. 23

Printer Status	Status Change Reason
Paper empty	Paper is run out.
Paper jam	Paper is jammed.
Ink empty	Ink is run out.
Output tray open	Output tray is open.
Fatal error	Fatal error occurs.
Parent sub-data no need	Parent sub-data is no more necessary.
Data no need	Print data is no more necessary.

FIG. 24

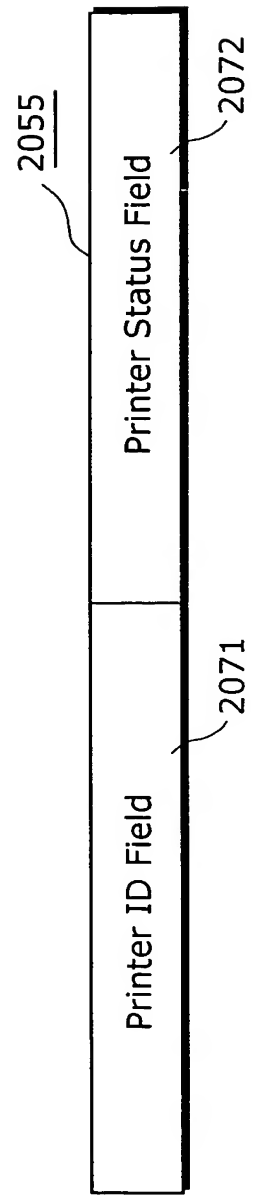


FIG. 25

Job Status	Status Change Reason
Pending	Candidate to be printed
Pending-held	Wait for candidate to be printed
Processing	Currently printing
Processing-poaren sub-data no need	Currently processing: Processing for parent sub-data completes.
Processing-data no need	Currently processing: Processing for print sub-data completes.
Processing-stopped	Processing for job is stopped.
Canceled	Canceling of job completes.
Aborted	Aborting of abnormal job completes.
Completed	Printing completes.

FIG. 26

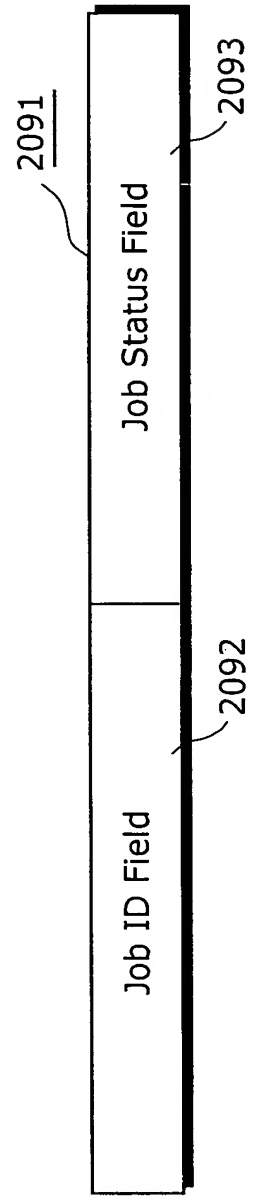


FIG. 27

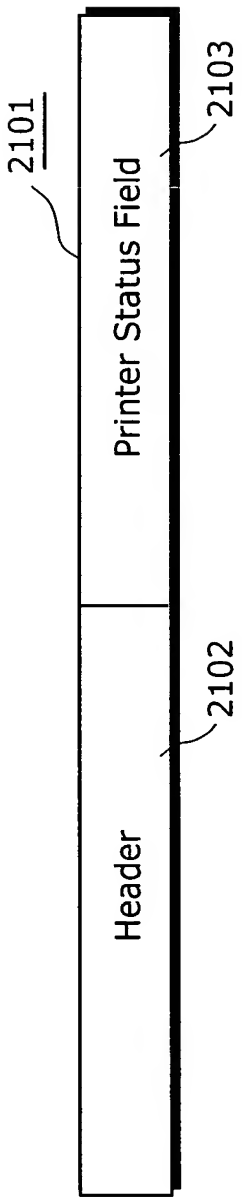


FIG. 28

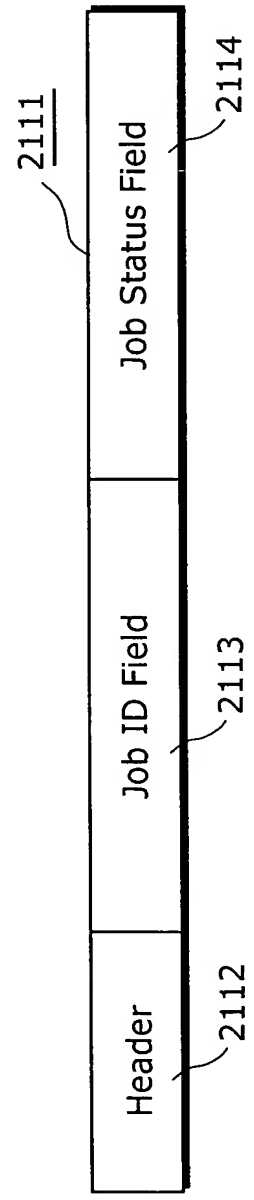


FIG. 29

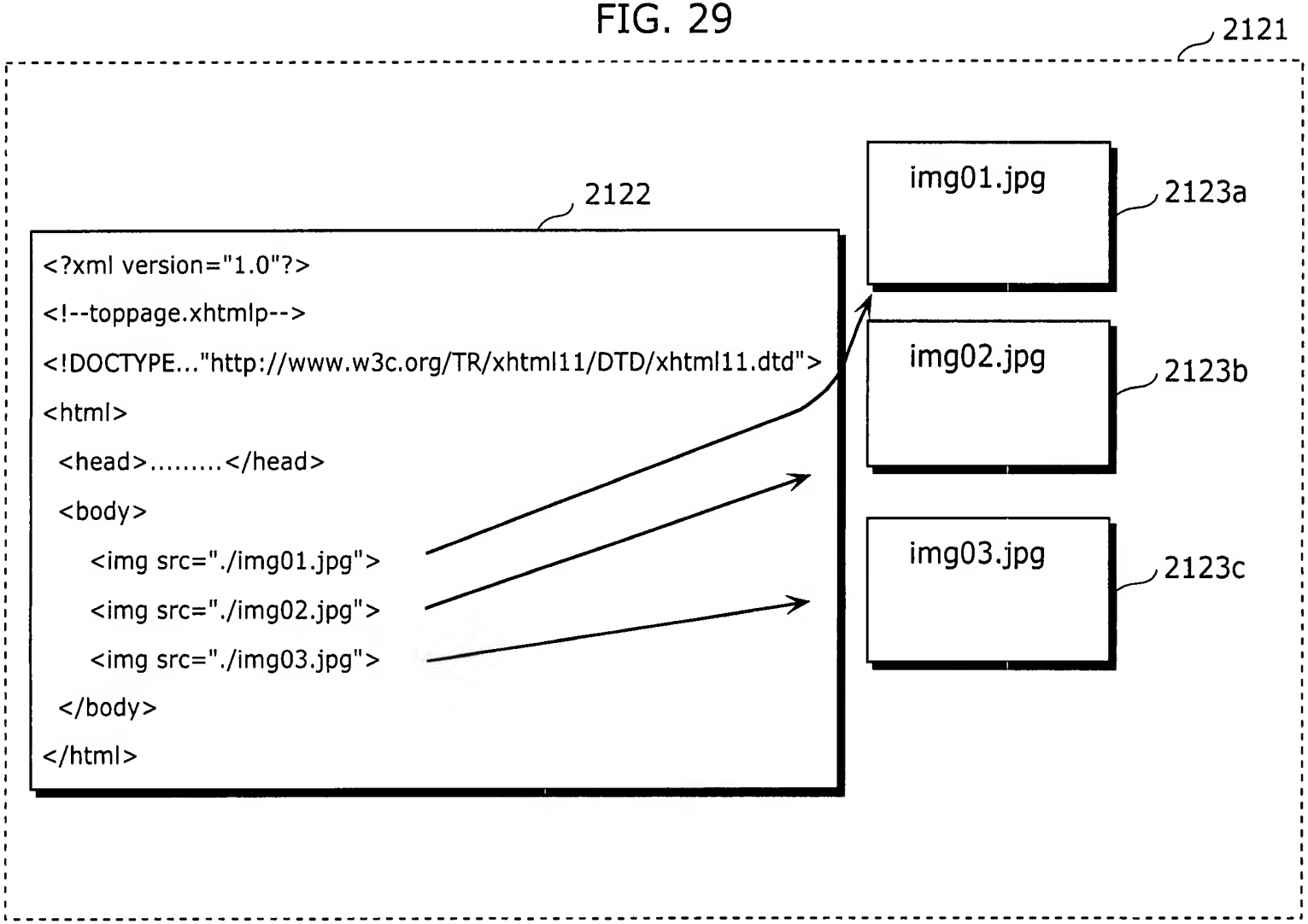

2121
2122
<?xml version="1.0"?>
<!--toppage.xhtmlp-->
<!DOCTYPE..."http://www.w3c.org/TR/xhtml11/DTD/xhtml11.dtd">
<html>
<head>.....</head>
<body>
<img src="./img01.jpg">
<img src="./img02.jpg">
<img src="./img03.jpg">
</body>
</html>
img01.jpg
2123a
img02.jpg
2123b
img03.jpg
2123c

FIG. 30

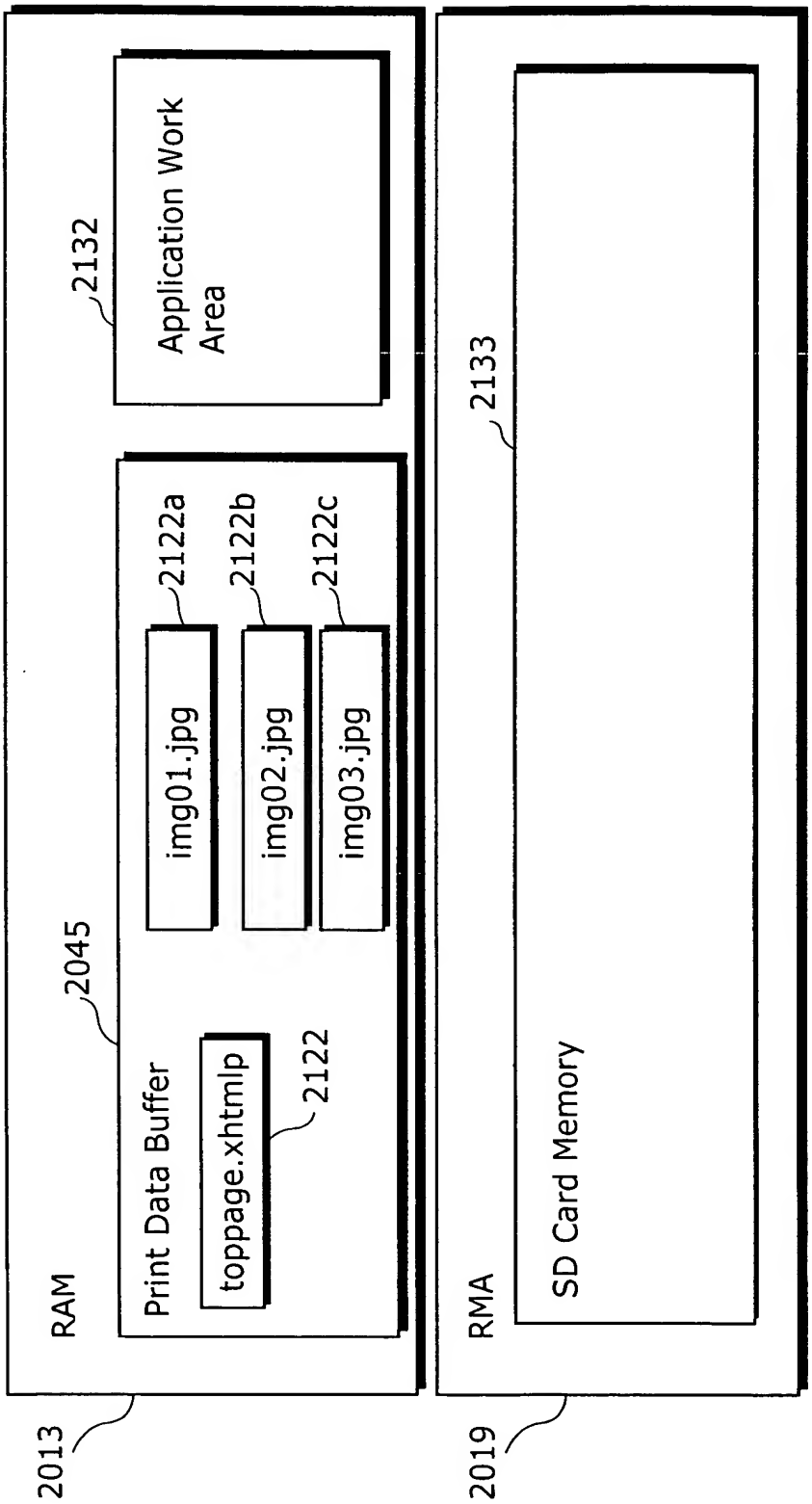

RAM
2013
Application Work Area
2132
Print Data Buffer
2045
toppage.xhtmlp
2122
img01.jpg
2122a
img02.jpg
2122b
img03.jpg
2122c
RMA
2019
SD Card Memory
2133

FIG. 31

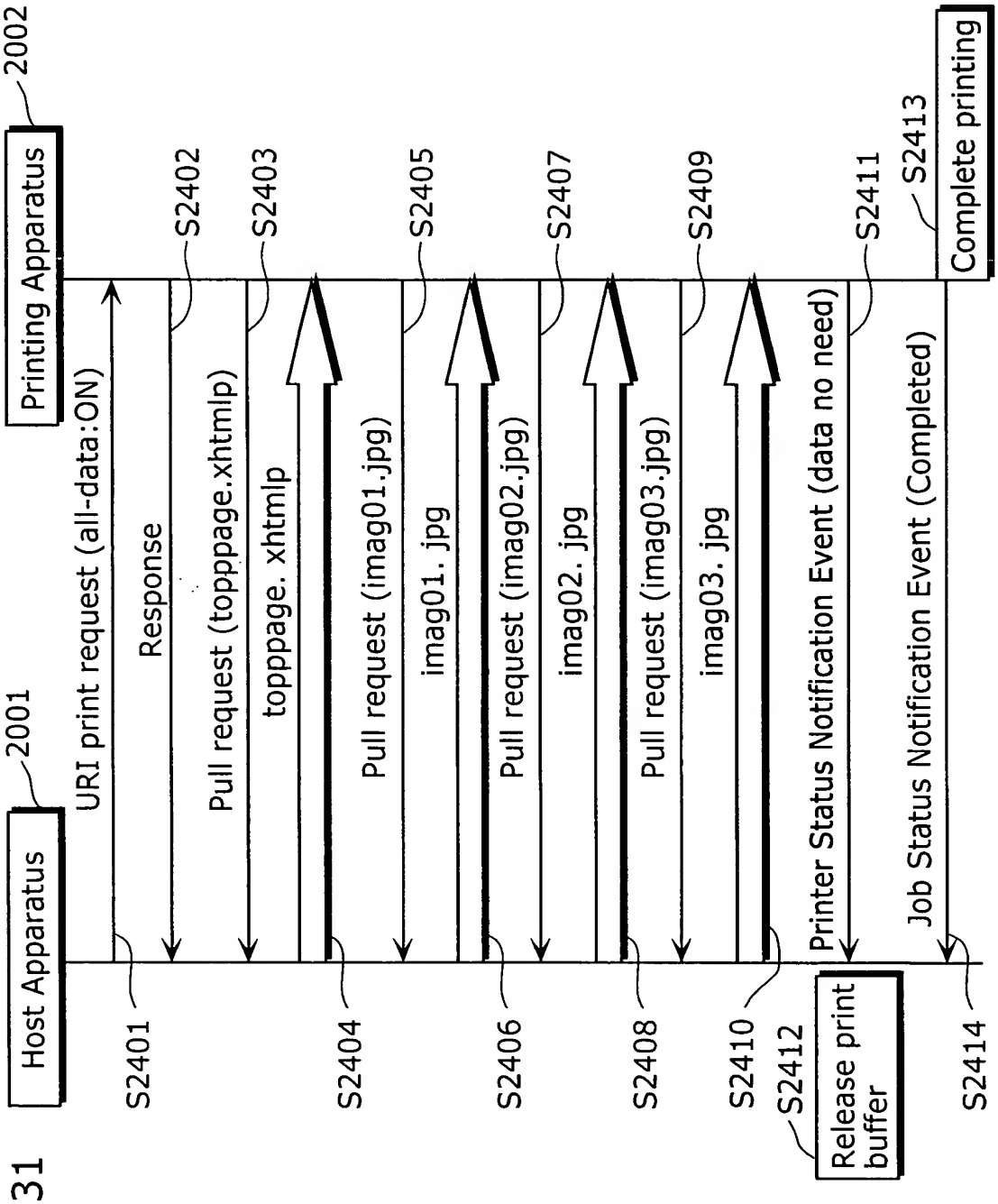

Host Apparatus
2001
Printing Apparatus
2002
URI print request (all-data:ON)
S2401
Response
S2402
Pull request (topppage.xhtmlp)
S2403
topppage. xhtmlp
Pull request (imag01.jpg)
S2404
S2405
imag01. jpg
Pull request (imag02.jpg)
S2406
S2407
imag02. jpg
Pull request (imag03.jpg)
S2408
S2409
imag03. jpg
S2410
Printer Status Notification Event (data no need)
S2411
S2412
Release print buffer
Job Status Notification Event (Completed)
S2413
Complete printing
S2414

FIG. 32

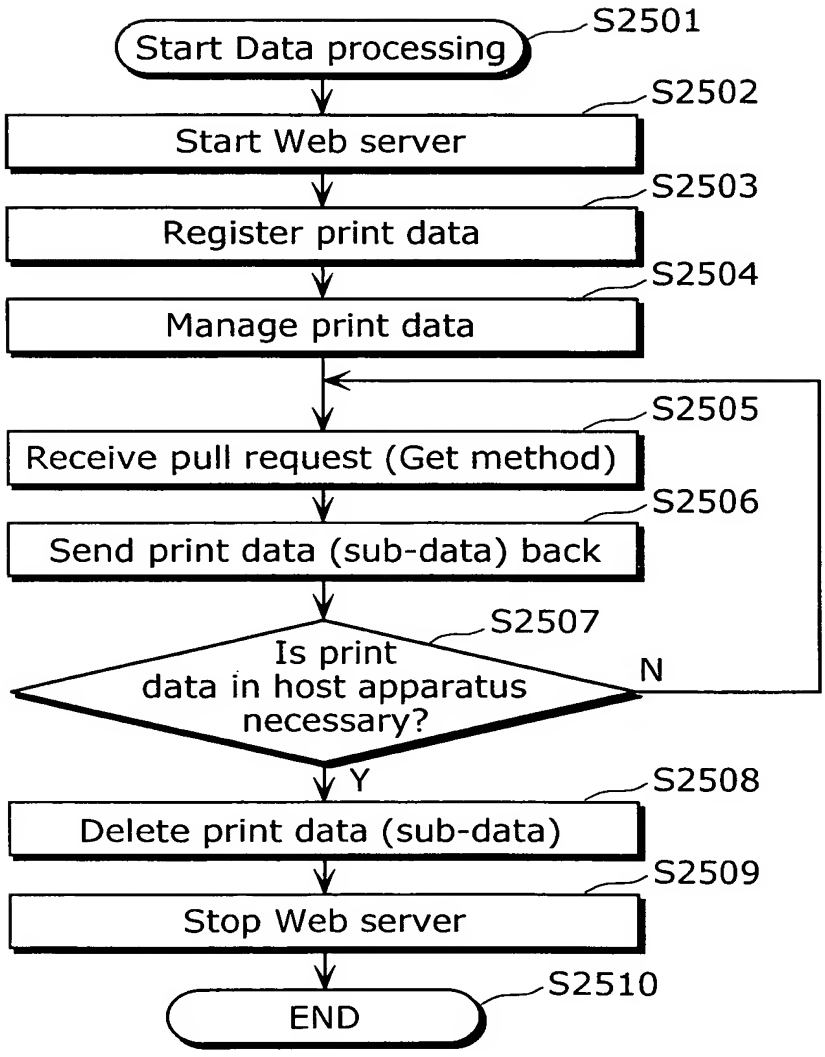

Start Data processing
S2501
Start Web server
S2502
Register print data
S2503
Manage print data
S2504
Receive pull request (Get method)
S2505
Send print data (sub-data) back
S2506
Is print data in host apparatus necessary?
S2507
N
Y
Delete print data (sub-data)
S2508
Stop Web server
S2509
END
S2510

FIG. 33

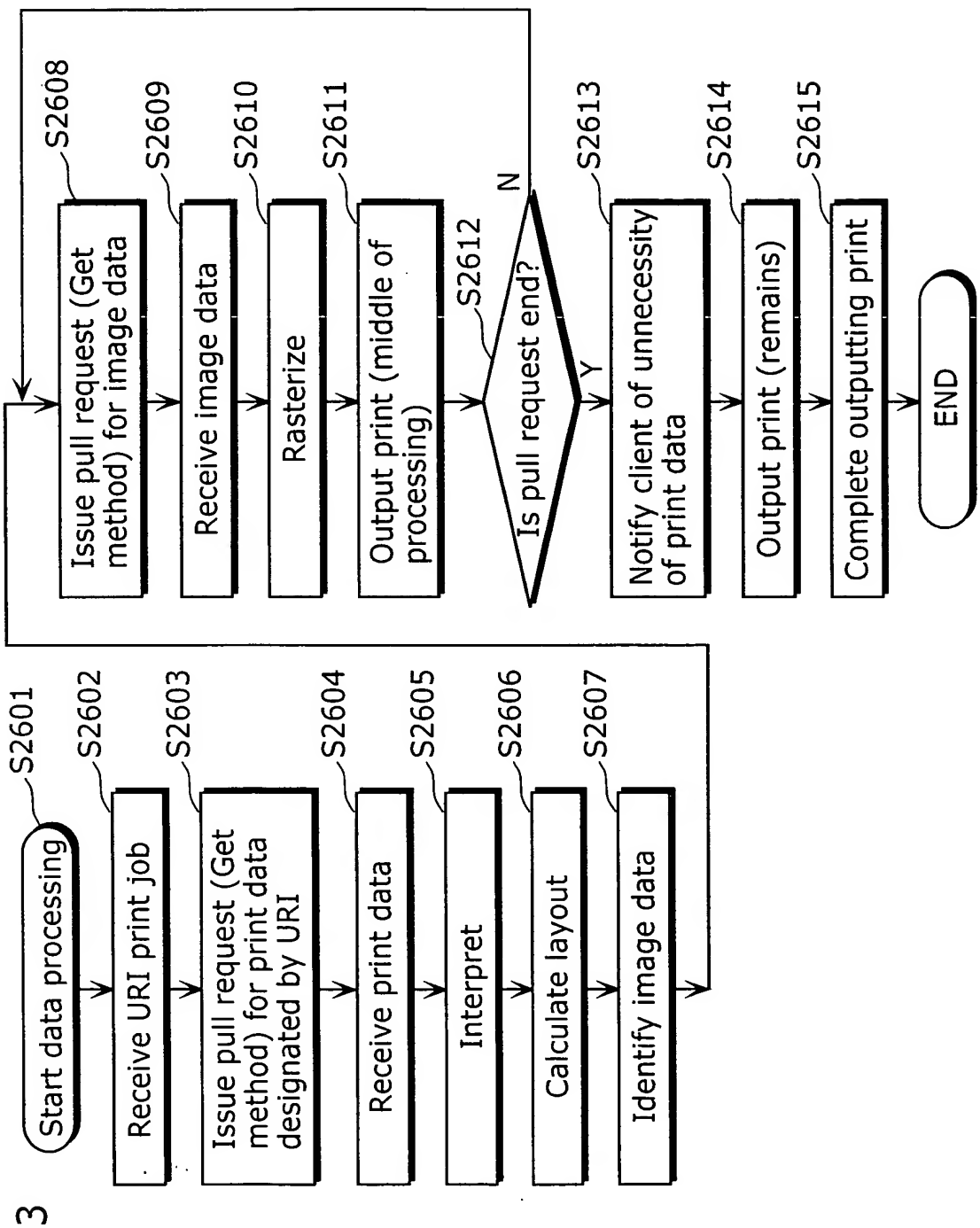

Start data processing
S2601
Receive URI print job
S2602
Issue pull request (Get method) for print data designated by URI
S2603
Receive print data
S2604
Interpret
S2605
Calculate layout
S2606
Identify image data
S2607
Issue pull request (Get method) for image data
S2608
Receive image data
S2609
Rasterize
S2610
Output print (middle of processing)
S2611
Is pull request end?
S2612
N
Y
Notify client of unnecessity of print data
S2613
Output print (remains)
S2614
Complete outputting print
S2615
END

FIG. 34

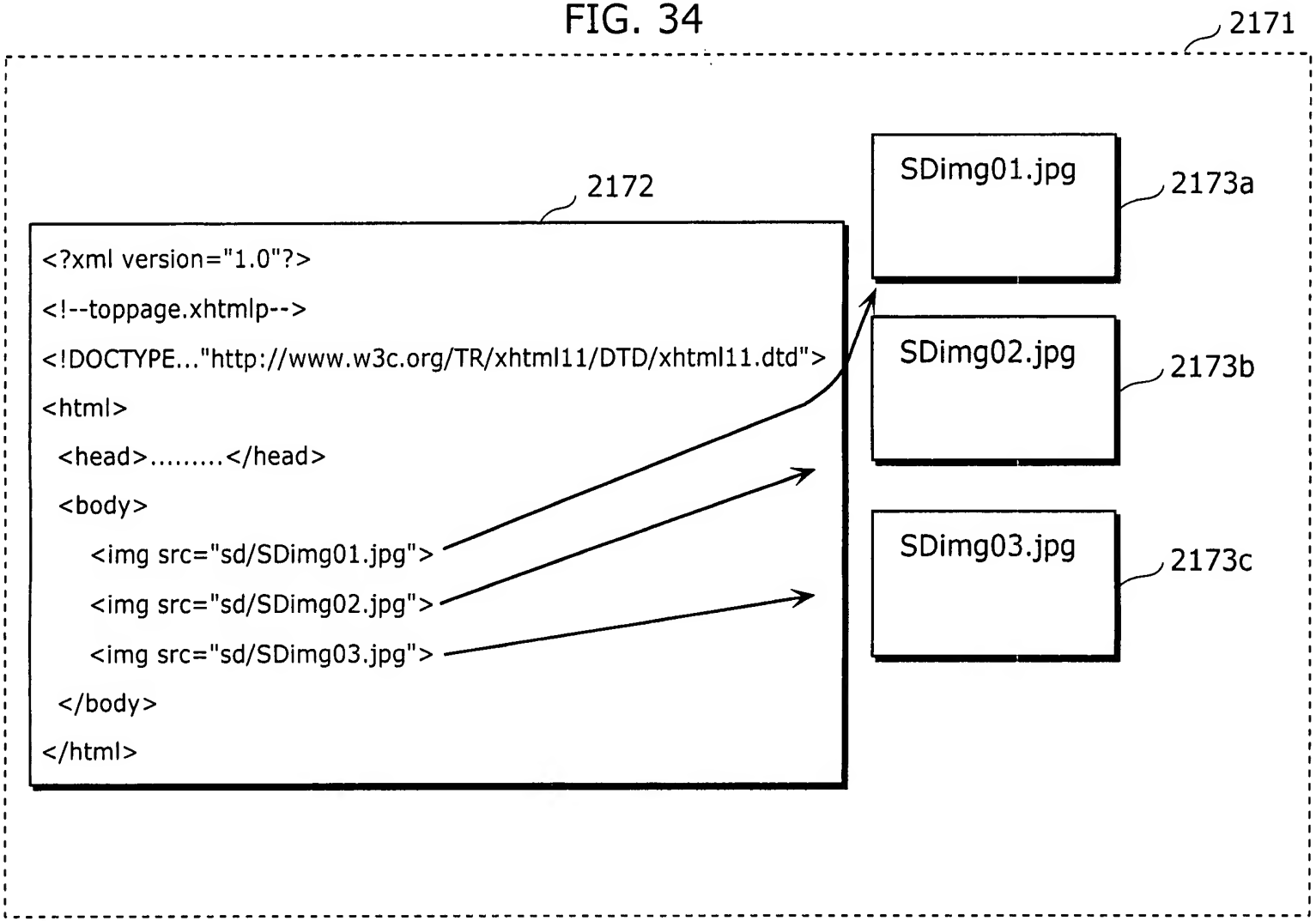

2171
2172
<?xml version="1.0"?>
<!--toppage.xhtmlp-->
<!DOCTYPE..."http://www.w3c.org/TR/xhtml11/DTD/xhtml11.dtd">
<html>
<head>.....</head>
<body>
<img src="sd/SDimg01.jpg">
<img src="sd/SDimg02.jpg">
<img src="sd/SDimg03.jpg">
</body>
</html>
SDimg01.jpg
2173a
SDimg02.jpg
2173b
SDimg03.jpg
2173c

FIG. 35

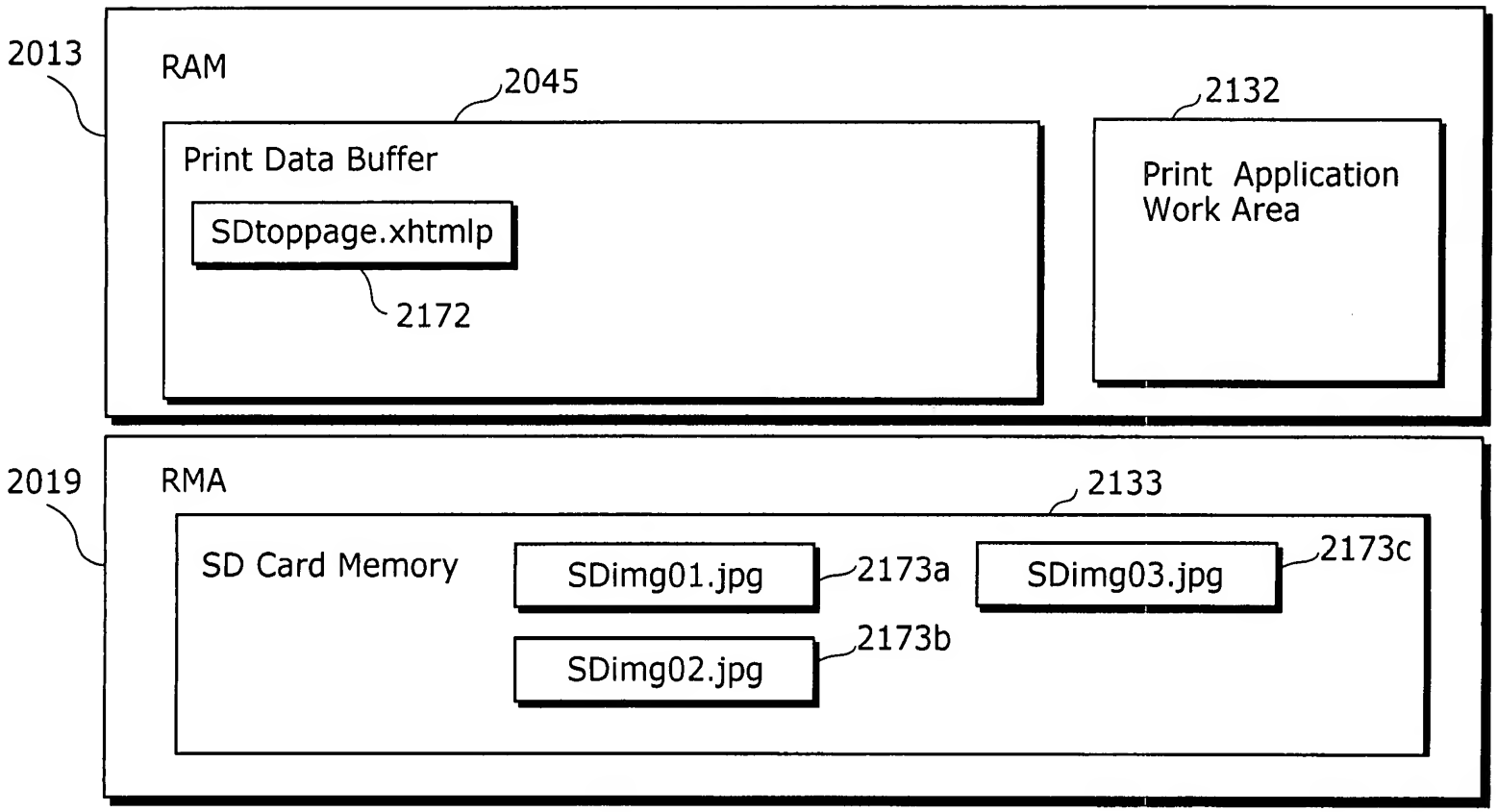

2013
RAM
2045
Print Data Buffer
SDtoppage.xhtmlp
2172
2132
Print Application Work Area
2019
RMA
2133
SD Card Memory
SDimg01.jpg
2173a
SDimg03.jpg
2173c
SDimg02.jpg
2173b

FIG. 36

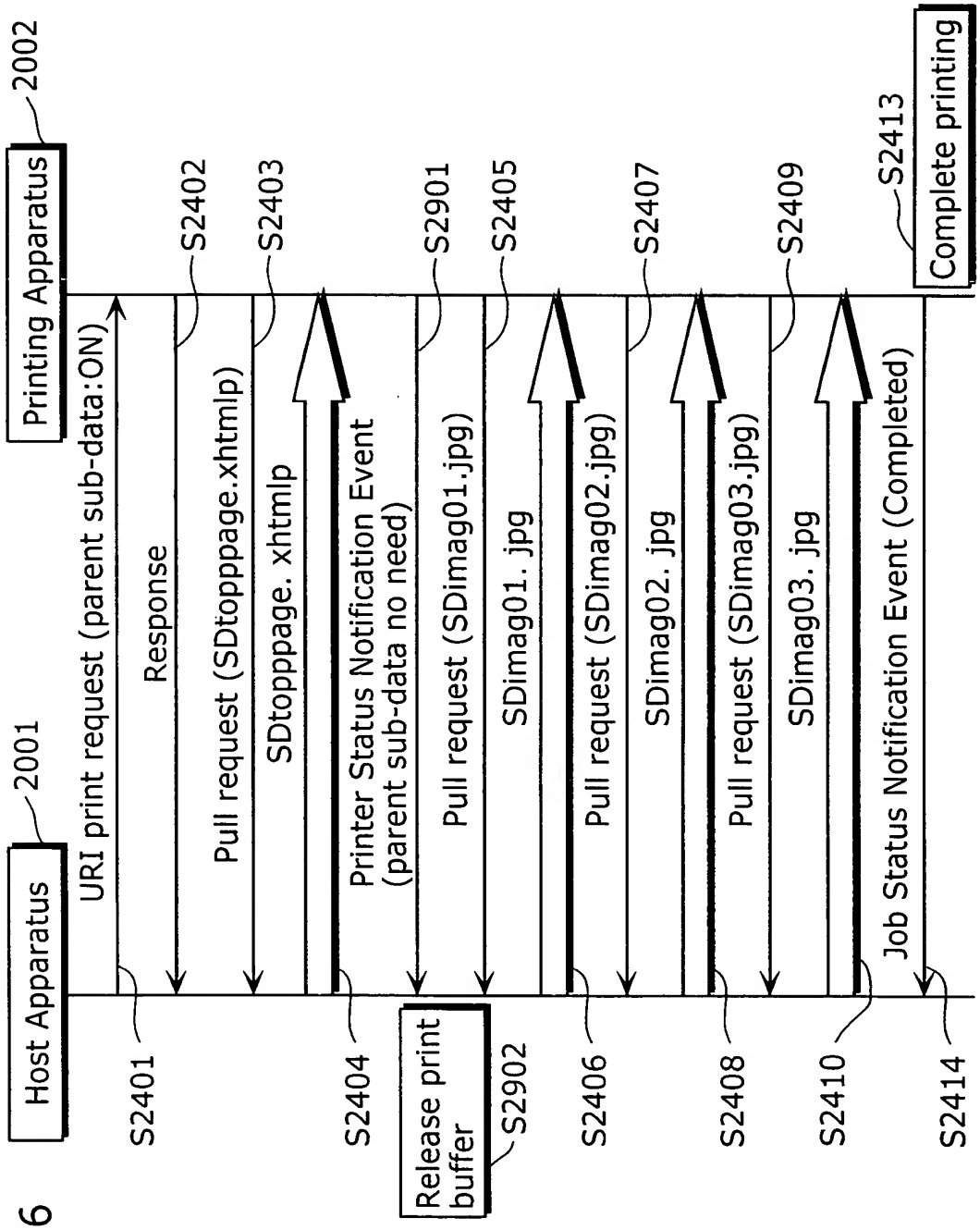

Host Apparatus
2001
Printing Apparatus
2002
URI print request (parent sub-data:ON)
Response
Pull request (SDtopppage.xhtmlp)
SDtopppage. xhtmlp
Printer Status Notification Event (parent sub-data no need)
Pull request (SDimag01.jpg)
SDimag01. jpg
Pull request (SDimag02.jpg)
SDimag02. jpg
Pull request (SDimag03.jpg)
SDimag03. jpg
Job Status Notification Event (Completed)
Release print buffer
Complete printing
S2401
S2402
S2403
S2404
S2901
S2902
S2405
S2406
S2407
S2408
S2409
S2410
S2413
S2414

FIG. 37

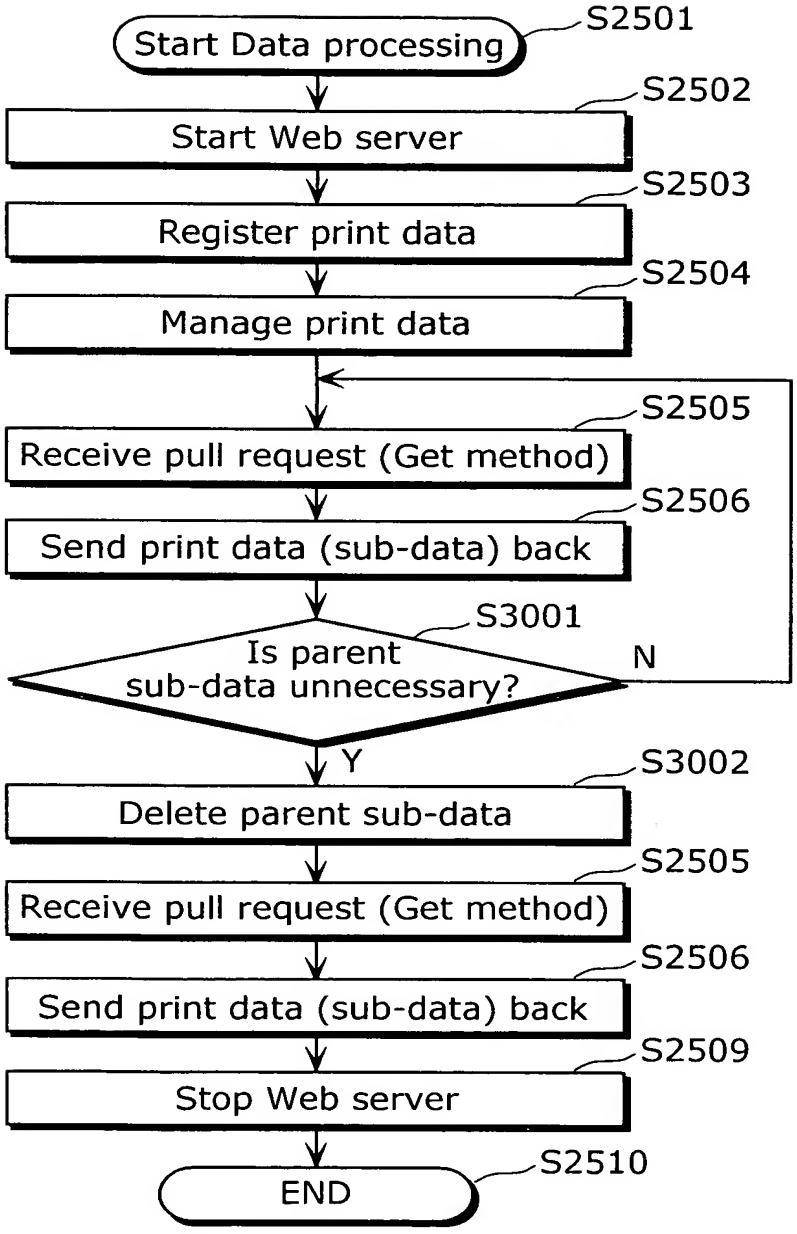

Start Data processing
S2501
Start Web server
S2502
Register print data
S2503
Manage print data
S2504
Receive pull request (Get method)
S2505
Send print data (sub-data) back
S2506
Is parent sub-data unnecessary?
S3001
N
Y
Delete parent sub-data
S3002
Receive pull request (Get method)
S2505
Send print data (sub-data) back
S2506
Stop Web server
S2509
END
S2510

FIG. 38

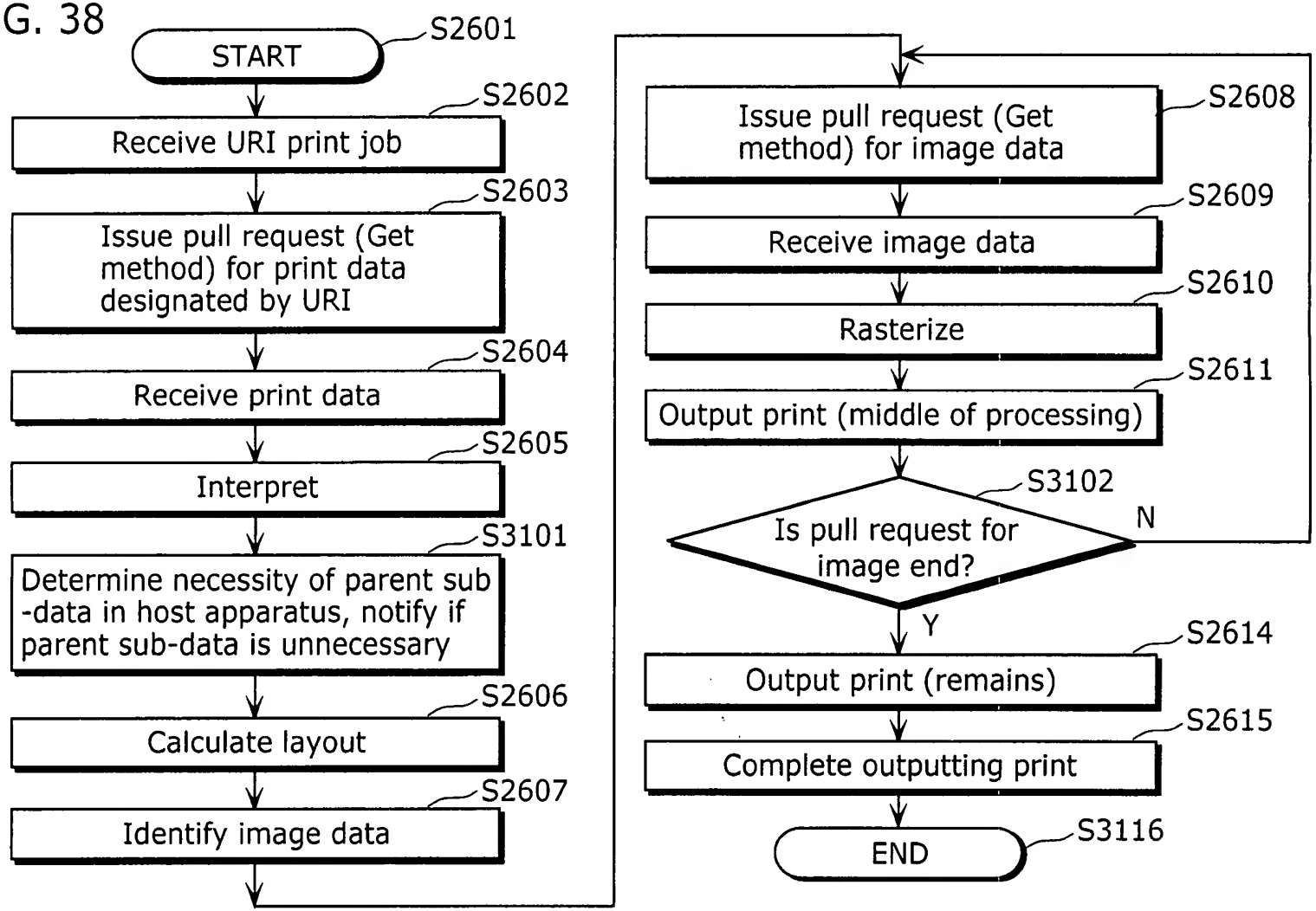

START
S2601
Receive URI print job
S2602
Issue pull request (Get method) for print data designated by URI
S2603
Receive print data
S2604
Interpret
S2605
Determine necessity of parent sub-data in host apparatus, notify if parent sub-data is unnecessary
S3101
Calculate layout
S2606
Identify image data
S2607
Issue pull request (Get method) for image data
S2608
Receive image data
S2609
Rasterize
S2610
Output print (middle of processing)
S2611
Is pull request for image end?
S3102
N
Y
Output print (remains)
S2614
Complete outputting print
S2615
END
S3116

FIG. 39

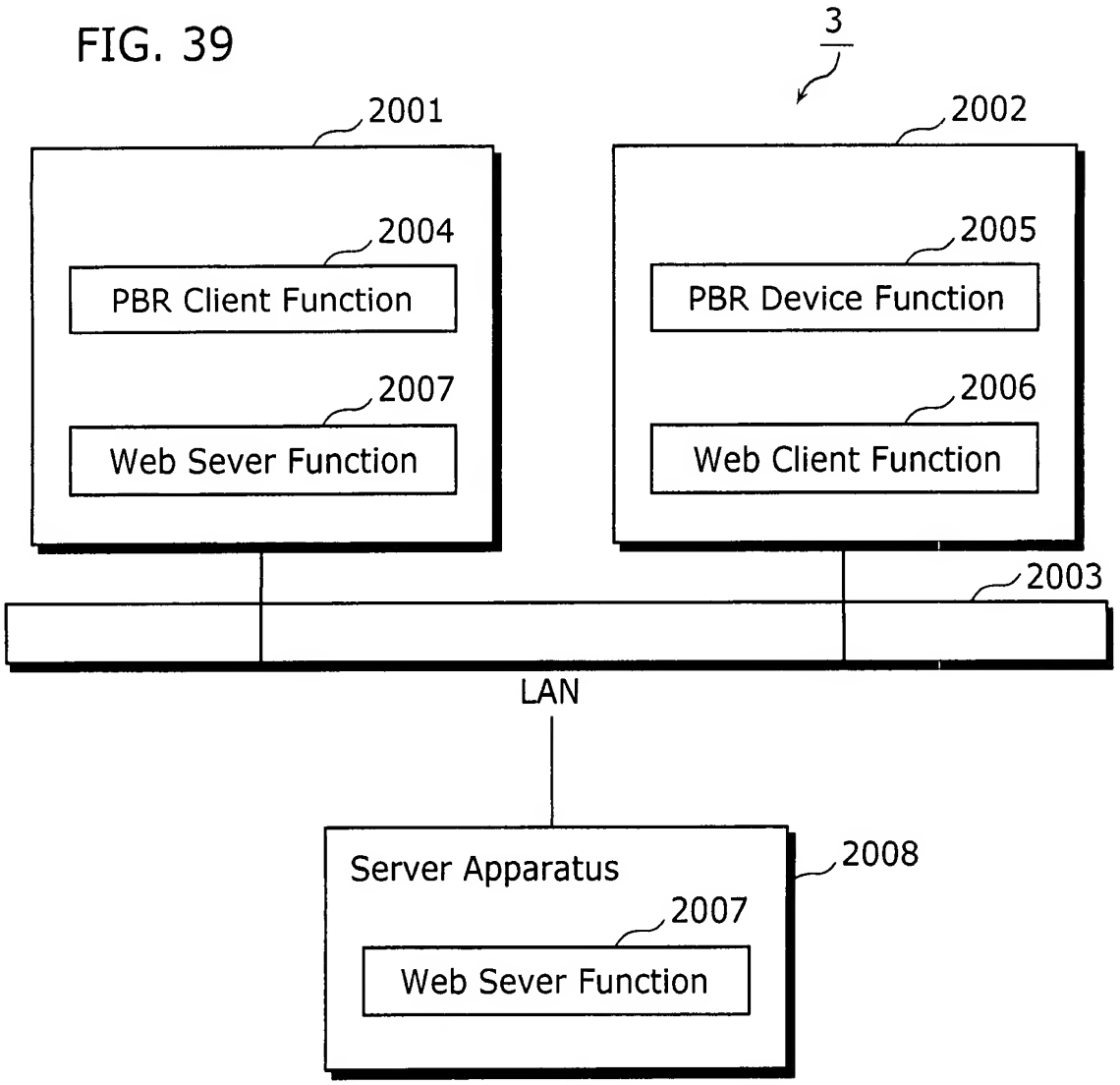

3
2001
2002
2004
PBR Client Function
2005
PBR Device Function
2007
Web Sever Function
2006
Web Client Function
2003
LAN
Server Apparatus
2008
2007
Web Sever Function

FIG. 40

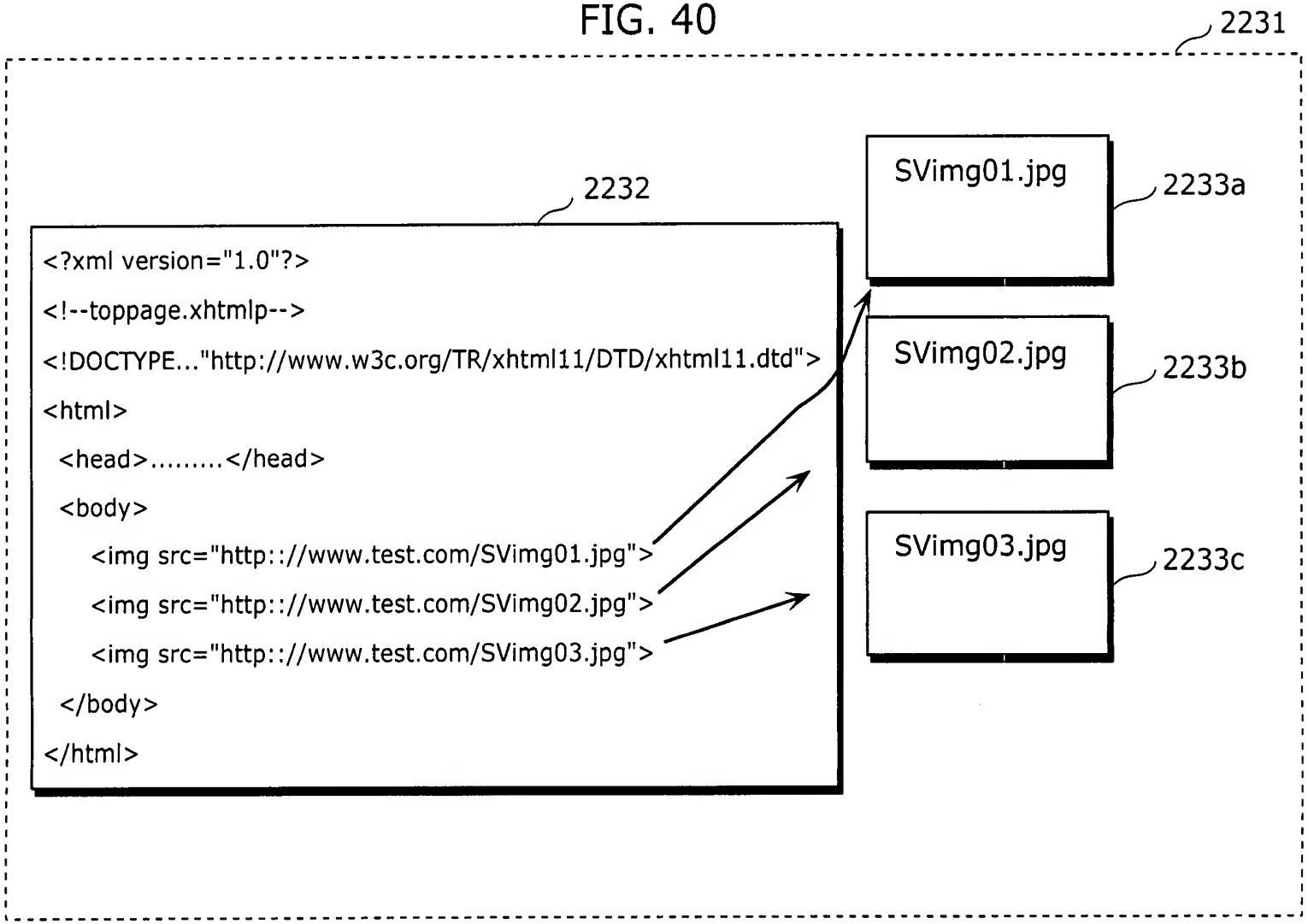

2231
2232
<?xml version="1.0"?>
<!--toppage.xhtmlp-->
<!DOCTYPE..."http://www.w3c.org/TR/xhtml11/DTD/xhtml11.dtd">
<html>
<head>.....</head>
<body>
<img src="http::/www.test.com/SVimg01.jpg">
<img src="http::/www.test.com/SVimg02.jpg">
<img src="http::/www.test.com/SVimg03.jpg">
</body>
</html>
SVimg01.jpg
2233a
SVimg02.jpg
2233b
SVimg03.jpg
2233c

FIG. 41

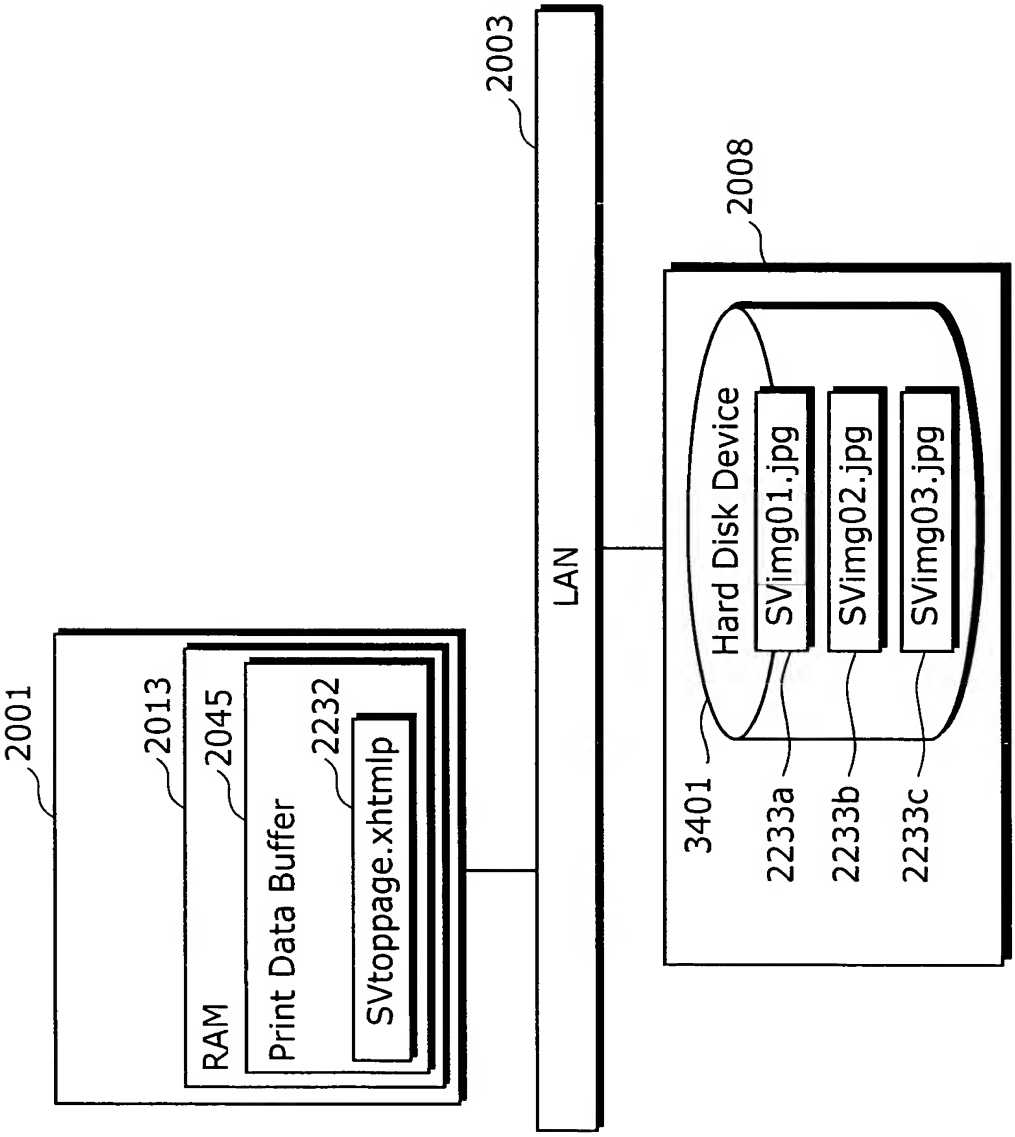

2001
2013
RAM
2045
Print Data Buffer
2232
SVtoppage.xhtmlp
2003
LAN
2008
Hard Disk Device
3401
SVimg01.jpg
SVimg02.jpg
SVimg03.jpg
2233a
2233b
2233c

FIG. 42

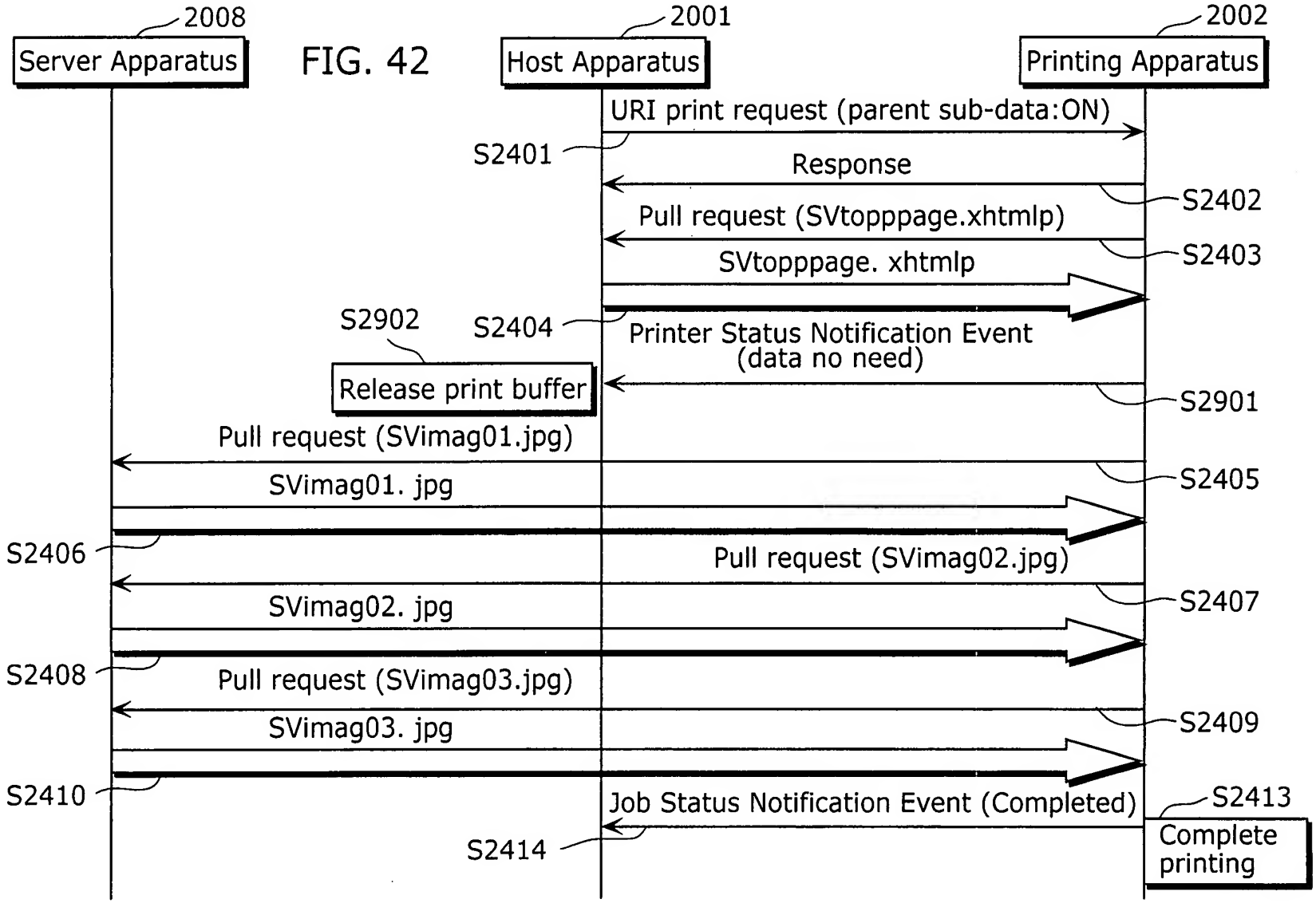

2008
Server Apparatus
2001
Host Apparatus
2002
Printing Apparatus
URI print request (parent sub-data:ON)
S2401
Response
S2402
Pull request (SVtopppage.xhtmlp)
S2403
SVtopppage. xhtmlp
S2902
S2404
Printer Status Notification Event
(data no need)
Release print buffer
S2901
Pull request (SVimag01.jpg)
SVimag01. jpg
S2405
S2406
Pull request (SVimag02.jpg)
SVimag02. jpg
S2407
S2408
Pull request (SVimag03.jpg)
SVimag03. jpg
S2409
S2410
Job Status Notification Event (Completed)
S2413
S2414
Complete
printing

FIG. 43

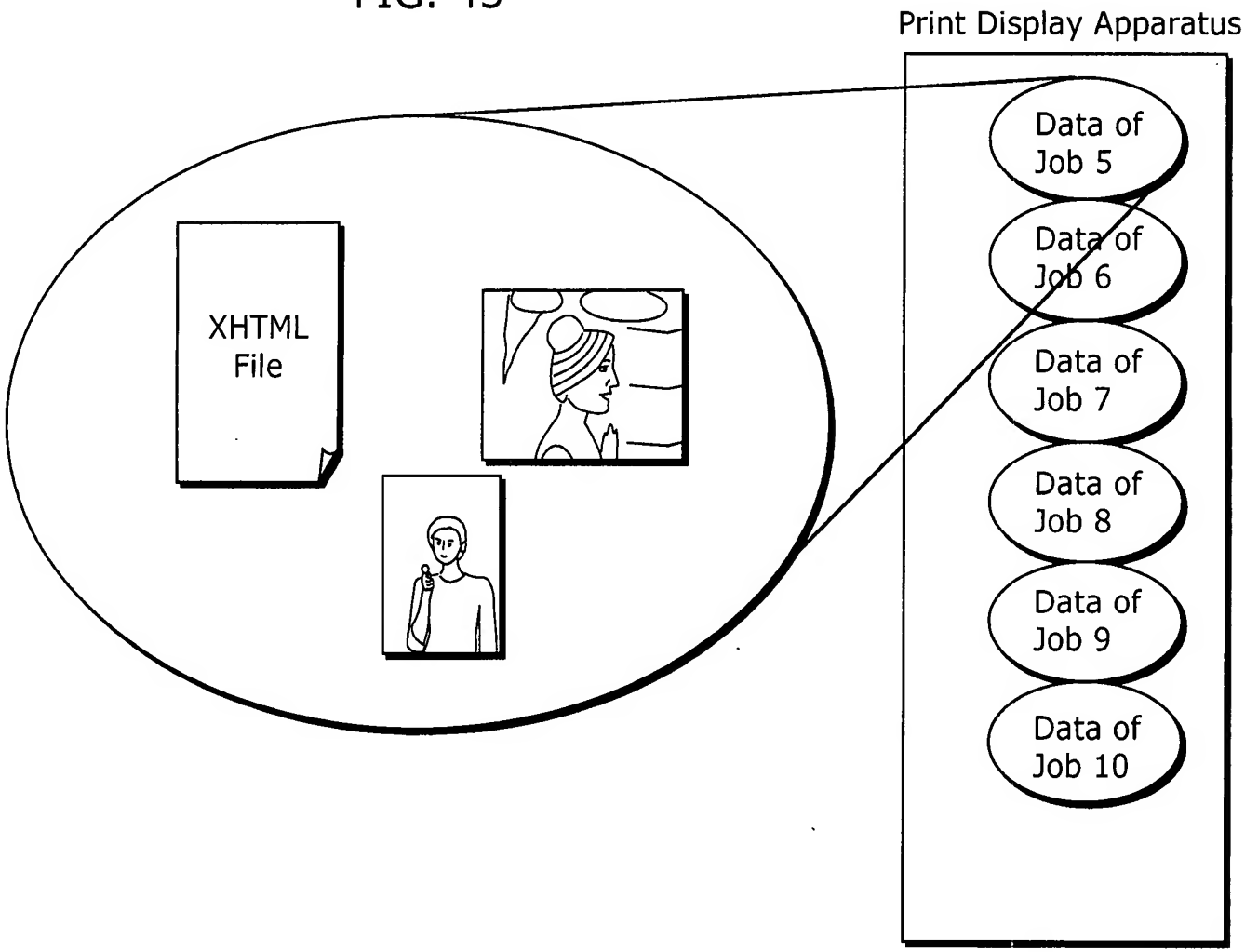
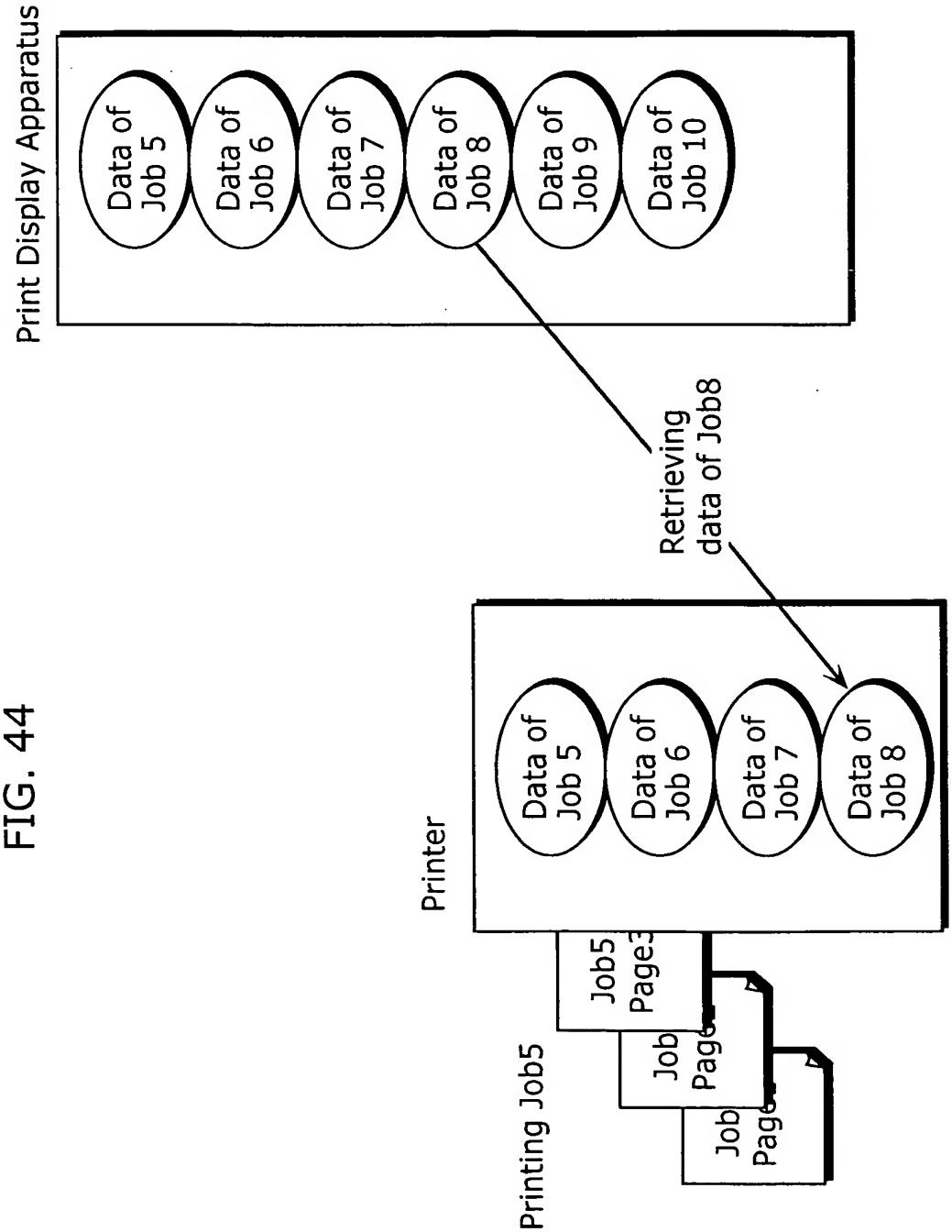

Print Display Apparatus
XHTML File
Data of Job 5
Data of Job 6
Data of Job 7
Data of Job 8
Data of Job 9
Data of Job 10

FIG. 44


Print Display Apparatus
Data of Job 5
Data of Job 6
Data of Job 7
Data of Job 8
Data of Job 9
Data of Job 10
Retrieving data of Job8
Printer
Data of Job 5
Data of Job 6
Data of Job 7
Data of Job 8
Printing Job5
Job5 Page3